REPORT RESUMES

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BENCH-MARKS 1964--THE IMPLEMENTATION OF TELEVISION IN EDUCATION.

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MANY QUESTIONS REGARDING EDUCATIONAL TELEVISION WERE DISCUSSED IN THIS REPORT ON THE ETV SEMINAR OF DECEMBER 5-8, 1963 IN CHICAGO, ILLINOIS. QUESTIONS DISCUSSED INCLUDED (1) WHAT CAN TELEVISION DO FOR THE PROBLEMS CONFRONTING EDUCATION, (2) WHAT ARE THE DEVELOPING PATTERNS OF USE OF TELEVISION IN EDUCATION, (3) WHAT IS BEING DONE IN OTHER COMMUNITIES, (4) WHERE ARE THE TALENTS TO USE TELEVISION IN EDUCATION, (5) WHERE IS TELEVISION IN ITS OWN TECHNOLOGICAL EVOLUTION, (6) WHAT ARE THE ECONOMIC IMPLICATIONS OF TELEVISION IN EDUCATION, AND (7) WHAT ARE THE SPECIAL LEGAL, PROFESSIONAL, AND ETHICAL PROBLEMS IN EDUCATIONAL TELEVISION. (LP)

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BENCH-MARKS '64 —

The Implementation of Television in Education

Depth Seminar #1
December 5-8, 1963
Chicago, Illinois

ED003793

ETV
BENCH-MARKS '64

THE IMPLEMENTATION OF TELEVISION IN EDUCATION

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FOREWORD AND FORWARD

The North Central Association of Colleges and Secondary Schools concentrates its attention and its effort upon the attainment and maintenance of high standards of education in 19 of these United States. It continually and actively encourages the achievement of higher standards of educational competence. Through its commissions on secondary schools and on colleges it examines schools and colleges for accreditation and counsels with their administrators. Through its Commission on Research and Service it seeks to collect, collate and report information which relates to education and educational standards and which will be useful to educational institutions in their quest for quality.

In 1953, the North Central Association formally recognized the importance of educational television with the appointment of a committee on television "to inquire into the status of television in education and from time to time to bring the attention of member institutions pertinent information in this regard."

During the ensuing three years, the Committee on Television formulated and published a policy on educational television, began preparation for a review of research and made elaborate preparations for a full-scale demonstration of educational television.

Since that time the Committee (now the Subcommittee on Television of the Commission on Research and Service of the North Central Association) has been responsible for the following major activities:

1956 - Staged a large screen demonstration of an actual WTTW telecast on the occasion of the 61st Annual Meeting of the North Central Association and made available research information and other pertinent information to the assembled educators.

1958 - Prepared an appraisal of the current status of television as a medium of instruction and published the appraisal in the quarterly publication of the North Central Association.

1959 - National Seminar on the Uses of Television in Education to assess existing knowledge and to identify principles and practices which could be recommended to member institutions.

1960 - Pilot Conference on The Principles and Practices in the Use of Television in Education - to involve state committee chairmen from the 19 states, representatives of five other regional accrediting organizations, selected educational television authorities, and representatives of national educational organizations in a pilot conference on the dissemination of educational television information with the support of the U. S. Office of Education under the NDEA, Title VII Program.

1961 - Published "The Uses of Television in Education" - upon the unanimous recommendation of the Pilot Conference and with the concurrence and support of the U. S. Office of Education, NDEA Title VII Program.

1961-62- Designed and sponsored eight dissemination conferences in five individual states and three regions on the model of the Pilot Conference under a contract with the U. S. Office of Education in keeping with the provisions of Title VII, Part B, NDEA.

1963 - Bench-Mark Seminar - to collect and evaluate the accumulated experience of a decade of educational television, to establish the level of development of the technology, to assess the successful educational applications, to comprehend the economics of the use of television in education, and to identify the current problems and future prospects of educational communication by television.

The following is a report on the Bench-Mark Seminar of December 5-8, 1963, conducted at the Palmer House, Chicago, Illinois, under a Title VII contract with the United States Office of Education:

INTRODUCTION

W9XK, University of Iowa, using the scanning disc for transmission of the picture, with simulcast over radio station WSUI, began systematic instruction in 1931. In early 1932, the first black and white, 35-line, television picture blinked and wavered across a little screen in a laboratory at Purdue University. By the end of 1939 experimental television stations at Purdue and the University of Iowa had spewed out picture making signals in several hundred telecasts, and reception was reported as far away as one thousand miles.

In 1940, Purdue engineers reported the purification of germanium presaging the development and use of semi-conductors and the birth of the transistor. The swift technological developments demanded by military necessity in World War II hastened the evolvement of television.

Then, in the post-war years, colleges and universities were in the front line of broadcast television. Iowa State University, operating a commercially licensed station, contributed greatly to the application of the new sight and sound instrument to educational communication. Education was no stranger to television from its very beginnings.

But, the new instrument provided a window through which the wares of the world might be attractively displayed. So commercially potent was the instrument that the necessarily large capital and operating investments could be justified. The viewers came to know the instrument more for the commercial fare it presented than for the communicative power it possessed for the enlightenment and advancement of a total society from the tiniest pre-school tot to the oldest among us.

Without the aid of profit dollars to offset the investment, but with a promise of gain far exceeding the dollars of commercial communication, pioneers of education worked at applying the instrument to educational communication. They waged a winning war to persuade the Federal Communications Commission that the society would be served best by the reservation of a substantial part of the television broadcast spectrum exclusively for educational purposes.

The direct beneficiaries of this relatively quiet but struggling effort to use and demonstrate the powers of television in education already number in the tens of millions. Many generations yet to be born will be added to these. But, despite a steady growth, the sifting of advancing knowledge and technology about television into the educational processes of the schools and colleges of the nation has been far slower than the proven potentials of the instrument would warrant.

Reasons abound by which this reluctance to embrace a new, expensive, and highly technical device can be explained. Doubtless, there are many analogies in the history of our technological society in which the resistance to change, or a threat to vested notions, has delayed capitalizing on the obvious. In the case of education, the firmly implanted conventional concept of a teacher in front of a small class of eager students has resisted the injection of a new communication device. Probably of greater influence has been our traditional devotion to the decentralized control and decision-making power over our schools and educational institutions, a tradition we treasure with appropriate reverence.

Now, however, the evidence is in. All the evidence needed is available to the leaders of our schools, colleges and universities with which they can help themselves and others to understandings and intelligent conclusions about the use of television for education.

Educational television is no longer a pioneering venture. The main trails have been blazed and trodden into highways to be traveled with safety and assurance by those desiring to reach the educational destinations of improved instruction and quality instruction for many new numbers of students. But, who is to travel this road? No teacher can travel it alone. No principal can very well acquire the vehicle just for his school, and few superintendents or college presidents can move a school system or institution into the economic commitment without the concurrence of those who establish policy.

It is true that the teacher gives to television the educational message to be conveyed. It is also true that the teacher's genius ultimately determines the communicative impact of the message. Still, the television instrument requires a leadership and an institutional commitment precedent to the existence of the opportunity through which the inspiration of the teacher can be enlarged and made available to many beyond his personal presence.

Whose job is it, then, to implement the installation and intelligent use of this new dimension in education? Whose job is it to assure a careful assessment of the powers of television as they might be applied to the specific problems of his school system or his college or university? The teacher, yes; the superintendent or president, definitely; and, as well, the school board member, the trustee or regent to whom falls the ultimate responsibility for educational opportunity and the quality of that opportunity.

Who, then, should read this material? Who should be urged to know the bench-marks of educational television in 1964?

Whoever you are, whatever your responsibility for education in this land - a parent, a taxpayer, a school board member, a trustee of a college, a university regent, a superintendent of schools, a principal, a supervisor, a professor, a teacher - that which follows deserves your attention, your interest and your careful consideration.

WHAT CAN TV DO FOR THE PROBLEMS CONFRONTING EDUCATION?

The Numbers Problem?

As Commissioner W. W. Waymack once characterized the Atomic Energy Commission's task, education has been "riding the bicycle while building it," for almost two decades.

Any superintendent, school board member, teacher, college or university president, grade or high school principal who served during the years since World War II can speak to the problem of vastly increased numbers of students. Despite the educators' own misgivings and the haranguing of the noisy critics, the educators may accept the credit for having kept faith with the vast new numbers.

What was done was accomplished for the most part with conventional tools in the conventional way and almost always with too few trained minds and hands to use the tools. There was not much time for studied innovation, and the stop-gap measure had to do. Much that was accomplished was done against the resistance of taxpayer groups, uninformed but concerned parents, reluctant legislators, and those within the ranks of the administrators and teachers who feared change more than they feared the consequences of a failure to keep faith with this suddenly huge, new generation.

The educators and the citizenry can take considerable pride in the tens of thousands of new classrooms they've built; the consolidations and reorganizations of systems; the expanded colleges and universities and multiplied opportunities for adult learning. But take no solace. The leading edge of the wave has now moved through childhood and adolescence, elementary and secondary schools, and an increasingly higher percentage of them are about to deluge the campuses of higher education.

Not until mid-1961 did the birth rate, which had grown at an increasing pace for almost 15 years, hesitate and level off. This occurred just two or three years before the leading edge of the population wave begins the formation of its new families. There is little to indicate that these many new families will not more than replace themselves in an affluent nation and, hopefully, a peaceful world.

The city superintendent needs no reminders that the numbers have also taken to moving about. They tend to congregate in larger population centers. They move about within the cities as well as on the fringes. The educators in the suburbs, in the small cities and in the towns and the rural areas have little difficulty recognizing the impact of shifting populations. They also see increasing costs, the wailing of the property owners, and the squeeze upon state tax revenues for supplemental aid. There is little the college or university president doesn't know about all this. He has sought for a decade and more to obtain support from both public and private sources to simply prepare for that which could be seen clearly on the horizon. Lacking the levers for persuasion available to the lower schools, and plagued by an even greater self-satisfaction with the proven conventional means of transmitting knowledge, higher education is ill-prepared to adequately accommodate the students seeking their opportunity for advanced study.

If numbers alone were the only dimension of the problem confronting education, perhaps, life could be simpler for education and educators. But, in addition, there is so much more to teach and to know. Concomitantly with the population surge of the post-war years came the scientific and technological revolution with its inevitable impact upon the social, cultural and even the political aspects of the society. This must be taught to the succeeding student generations at one level or another if they are to be even reasonably at home in the adult world.

Thus far education has but reluctantly accepted the products of the scientific and technological revolution which it can adapt to its teaching needs. Among these products are the new educational media, not the least of which is the television instrument, which have the power to transmit anything from the poorest to the best in educational communication to individuals within a classroom, or across the nation and even the world around.

The few who have tried know that television can tie together classrooms, schools, systems and even state-wide and regional collections of schools to bring the best in formal educational communication to multiplied thousands of students. They know, too, that television encourages improvement in teaching and permits the re-alignment of the best of teaching resources into multi-media teaching and learning, and tha best talents of teachers into team teaching. The television instrument itself introduces supplemental capacities for showing the microscopic to the naked eye, and for bringing to the individual student views and viewpoints which he might never be privileged to see or know.

The ultimate test of educational communication must be made at the receiving end - the mind of the individual student. The test of the transmission system lies in its capacity to carry the stimuli that triggers the learning response. Television has been applied to education and has passed its test. At the same time it has added a facet or two from its own capabilities. It has done so with forewarning that, given a chance, it will challenge the conventional approach to educational communication. It can meet the demands of the vast new numbers who must be taught and do the job as well and, perhaps, better.

Though each one cares deeply about the education of the individual student, the administrator, the school board member, the president, and the principal is so overwhelmingly occupied providing for the sheer numbers of students that, too often he does not see the potential for the individual student nor the powers of the television to reach many more students.

PROBLEMS AND NEEDS OF EDUCATION IN THE 60's

SECONDARY EDUCATION

Benjamin H. Willis, Superintendent, Chicago Public Schools

Last July, I was taking a look at the 1960 census with some members of our staff in the process of preparing one of these reports that we do occasionally for the board of education. In looking through the census, and gathering the information I needed, my curiosity was aroused because of what's happening in the large cities. What's happening isn't very difficult to find from census material.

In the first place you find that the income levels seem to be going up. It costs more to live, but you find some rather striking differences when you begin to associate census tracts and districts, or make comparable associations in whatever way a city is organized.

When you take a look at the professional employees in the various districts of a city, you again see some striking changes. Then if you look at such an item as education completed by those in the homes who are 25 years of age and over, according to the census you find in a city such as Chicago that maybe as late as 1950, the city was ahead of the state and, also, ahead of the national picture. You get to 1960, and the city is below the national median, below the state median.

So when I began to say to our people in this report that two of the twenty-one districts in the city are in much worse condition than any state in the union, people were a little aghast. I merely cite this instance to indicate tremendous changes going on in this city and this country in the last two decades in the movement of people.

The direction of change in American education during the next decade will be charted by the challenges we face today. I would list them as a rising population, a nationwide mobility of people (take a look at the figures of what percent of population is living in areas of ten thousand or more, or 2500 or more), the advancement of technology, and the rapid accumulation of new knowledge. All of these telescope into a kind of directional signal for future courses of action. It seems, better ways must be found for more people to know more in less time through more avenues for reaching the individual at the point of greatest need. I have already implied that one of these points is in the large cities.

It seems to me that time is of the essence. The college enrollments will double within the next ten years, and it's possible that 50% of this increase will occur almost before next Saturday - that is, in two or three years. It would seem that these numbers would call for a level of articulation not yet achieved between colleges and secondary schools, and for equally close articulation between scholars and the academic disciplines and those in teacher education. The need of increased articulation in all subject areas between the elementary and high schools then must follow. Already there has been a rapid expansion of the numbers enrolled in advanced placement courses, in the numbers who write college board examinations. Sequentially developed kindergarten through grade 12 education programs are increasing.

Not only has there been a concern for some time about the quality of what we teach, but there has been an equally important movement to emphasize the process of education. More and more people are engaged in research in cognitive learning. In the period ahead there will be an equal concern for effective learning. Pre-service education of teachers will change greatly, and an effective means of continuing mass in-service education will likely be developed. We have a group of 25 or 35 college seniors here in the city spending three months. We are trying to urbanize them. They are from the liberal arts colleges not too far away in the Midwest. They are having an experience in each of two types of schools. Part of this service is in schools which would be classified by some as slums, or in the slum area - and then a part of it somewhere else.

For many reasons increasing provision will be made for easy access to life-long learning for adults. Employment trends indicate a steadily increasing shift in the composition of the work force, from wage employees to salary employees. Industry and education will join forces in creating opportunities by meeting training requirements for supervision, research, engineering, maintenance, even cost analysis. Training and re-training in job skills to keep pace with technological progress will require a continuing canvass of the labor market and a corresponding reappraisal and revision of vocational schools or their curricula. This may surprise you, but it would appear that civic, industrial and community agents will close ranks with the schools in helping youths who are out of school and out of work. Drop-outs call for a teen-age census in high school of those who will respond to counseling services, to encouragement of full or part-time school attendance and work-oriented courses. The surging mobility of the people across the nation will require more literacy classes for both youth and adults. You might go out in the schools in the city and find 8000 people tonight - maybe closer to 9000 - who are going to school, many unable to read or write when they started. They're all on relief. They do not have a basic command of the three R's.

Broader programs of organization for newcomers to the big cities will come in the wake of this mobility. Part-time evening and TV college courses that have mushroomed in the past few years can be expected to expand greatly within the next ten years. Health and medical services in the schools will be expanded. Closer coordination will be achieved between the work of the schools and the health and welfare agencies, both public and private. I would hasten to add that I rebelled against that as long as anyone else, I guess. Probably longer than anyone here, because I've been around longer.

Counseling services will be expanded at the elementary secondary and college levels, and I would add, a pattern of continuity and guidance will emerge. I thought John Gardiner meant what he wrote in his report two or three years ago, when he suggested that maybe the schools should try a pattern of having the counseling service go on through 21, and not depend upon the employment agencies and a few others. He didn't really mean it to the tune of putting up a half-million dollars, or something like that, but after all, this is continuity in guidance.

Automated systems will augment the inventory of pupil strengths for more effective guidance, for grouping by ability, and for increasing information about aptitudes. They will enhance the inventory of teacher strength by which to make assignments which more effectively use their talents and training.

More improvement of parents participation in the school life of their children will follow today's efforts. Today in Chicago, we need to have parents team up with the school and the pupil to work together toward the realization of his goal. The development of techniques to provide large group instruction and at the same time obtain an understanding of individual learning problems will be a determining factor in the use of instructional media.

Closed circuit television will be developed for clusters of schools by means of coaxial cable linking schools having similar pupil population characteristics into a network. Thus the best teaching talent of the connected schools will present television lessons to children of similar needs, possibly through team teaching utilizing the strength of the combined staffs. In fact, we're moving from six teachers in Grade 1 in one school to, I guess 30 teachers in the first grade in 5 or 6 schools through this network.

Programmed learning, now in its infancy, may be the answer for some kinds of learning if properly developed and utilized. The automated classroom, hardly more than a dream, could prove the answer for providing for the individual, if the American scientist and businessman will give serious attention and adequate sums of money to the development of this field. When I was meeting with the investment bankers Tuesday of this week down in Florida, I walked down one corridor where there were four Fairchild TV cameras, selling the idea of investing more in Puerto Rico. Really tremendous things have been done in that country within the last two years. You push a button; you get a twenty minute story on their water system. Push another button; you get another twenty-minute story. All you have to do is push it over again, and you get it all over again.

It would certainly help a lot if you could hasten the day when the people developing this cartridged, six-minute machine make it possible to handle them like books in the library. It will be here before long. The businessmen and the scientists have to get in on this and help with these things. It takes a little money to get there though.

There will be changes in the procedures of recruitment, selection, placement and orientation of personnel. These procedures will take into account the need for teachers who are skilled in orienting the in-migrant child, and those children of limited background, to urban ways of life. Having lived with this for several years now, I'm beginning to understand something that I wouldn't believe two years back. We will seek more teachers with backgrounds in liberal arts and sciences to open doors to cultural opportunities for all children. In this regard a five-year program of pre-service teacher education, including an internship period, will become the mode. Fellowship programs for teachers will be strengthened. Study teams, workshops, teacher exchange programs, internships will play a more important role in continuing professional growth. More school buildings, undoubtedly, will provide for flexibility of scheduling to accommodate such things as team teaching. Out of 500 and some, we do have one building that not only is air conditioned, but you can also hook two rooms together, or four rooms, or three together by moving a few partitions. In that case, one teacher can work, and three can have a cup of coffee, or something else. In any event, it may take a hundred years or a hundred and fifty years from now before adaptability to the changing needs of youth and better ways of learning will be the basic factors in architectural design. Facilities which will permit extensive use of electronic instructional equipment will be typical rather than atypical. The tendency to regard education as an investment in America's economic future may yet take hold. I would like to say it will take hold.

Raising educational levels is fundamental to America's basic concepts and to the dignity of the individual and to the individual's goal of self-realization. Raising educational levels, particularly of the unskilled laborer, is also a dollar and cents proposition in the light of relief rolls and unemployment compensation. In this connection, federal aid to vocational education and closely allied programs certainly will be expanded. Financial aid from the federal government will be allocated to the big cities to offset the adverse effects of urbanization, mobility, and technology for the same basic reasons as those underlying federal aid to impacted areas. The only problem is that we appear to have, more than half the Congressmen with at least one school or area in his district in an impacted area. Some day maybe they'll get a few more Congressmen from the cities. The cities are impacted. Migration to urban centers for many states is a national as well as a local problem and will continue to be for some time.

Perhaps the most promising change in the next decade of American education is the current resistance, or lessening of resistance to change itself. Time lags are shortening. New concepts in teaching and learning are increasingly viewed as areas of adventure into the world of research and development.

PROBLEMS AND NEEDS OF EDUCATION IN THE 60's

HIGHER EDUCATION

Norman Burns, Executive Secretary, North Central Association of Colleges and Secondary Schools

Superintendent Willis came up with the same basic reasons for the problems that we face today - the problems of the 60's for both secondary and higher education. Primarily it is the question of numbers. Recently I found in a release from the Office of Education, dated December 3, that there are four and one-half million people in 2,140 institutions of higher education registered in the fall of 1963. This is an appalling number of people. It's 7.7% more than we had in the fall of last year; and since 1951, we have more than doubled the number of people in higher institutions. This is the problem. There it is right there.

Related, of course, to that are: the rapidity of the growth of human knowledge, the extraordinary rate at which the development of new knowledge is taking place and the demands of a technological society, such as ours, for new specialties - for specialists to be prepared to perform new undertakings in the service of our society. The tremendous proliferation of special fields requires more highly specialized training. This job falls on our colleges and universities along with the need to take care of the tremendous new numbers with which they are faced. These are all part of the same thing. The rising demands of the technological society are one of the reasons, I suppose why we are having such a rapidly increasing percentage of our youth of college age attending college or attempting to attend college. It's all related to this matter of a highly advanced technological society.

Now, what are the answers to this complex of problems? In part the answer lies in leadership - educational leadership - and this relates to one thing that is certain. We can not continue with business as usual in our colleges and universities. We've, I think, got to do away with some of the sacred cows, for instance, the insistence on the low student-faculty ratio. This, you know is an historical accident anyway. With our tendency to use normative data for making evaluations of things, for making judgments about things, we came up with the desirable student-faculty ratio. I think it's been 13 to 1 for heaven knows how long. Actually, this came to be not because it was necessarily desirable, but because a lot of the colleges in this country are very, very small and in order to have a sufficiently large faculty to cover the breadth of subjects that you would expect to cover in a large college, they had to have more faculty than they needed per student. So the average came out to be something like 13 to 1. This has come to be a kind of standard or norm by which we judge the adequacy of the faculty in terms of numbers, with reference to the students.

This is the kind of thing which I think we've got to break. At least we have to examine it very carefully as we move into this period of accelerating growth and development. The whole business of class size is another. It's amazing how many faculty members who still insist that they can't teach a class effectively if they have more than 20 students out there in front of them. There are many, many attitudes of this kind. They are going to be looked at very carefully, and I think it's fair to say that a lot of attitudes among our faculties in our higher institutions are going to have to be changed.

Certainly it's a time for bold and imaginative experimentation. We're not going to be able to staff our classrooms as we have in the past. We're not going to be able to afford the luxuries of short days, long vacations, low student-faculty ratios, small class size. These things were nice in the day when the higher educational enterprise did not face the demands that it faces today. We're not going to be able - even if it were a good idea - to hold to these ideas, because there aren't going to be enough teachers to go around.

We certainly need more faculty members. We need more institutions preparing faculty members, and we need more institutions to prepare faculty members to prepare more than they are preparing. This is a very easy thing to say, of course. It's not a very useful observation to make because it's at much too high a level of generality. When we say we need more faculty members, what do we mean precisely?

Well, I think among other things, we do need more faculty members of the traditional type; that is, with the traditional kinds of preparation, the Ph.D. degree involving research and we hope teaching competence, though we don't concern ourselves very much with that oftentimes. We need some of the trained specialists, the educated specialist in one or another of the disciplines. We need lots of other kinds of people in our faculties too.

As we move into this period of still further expansion and growth, one of the attitudes that needs to be changed is the notion that a faculty member is a faculty member and he ought to have a Ph.D. of a traditional kind and that's the end of it. We've got to come more to recognize that there is a certain differentiation of faculty. There are a variety of jobs to be done on the faculties of our institutions of higher education. If we're going to have a variety of functions performed, we need different kinds of people to perform them. I think the institution of higher education is the only organization I know of that has recognized that there are all kinds of jobs to be performed, but which insists on the same kind of training for performing all of those jobs. This just doesn't make any sense.

We are going to have to think in terms, I think, of something less than a Ph.D. for large numbers of our college teachers. Actually, you see, this is what we have now. A lot of people don't really realize that we have never had on the average more than about a third of the people teaching in our colleges and universities with a Ph.D. degree. Now, certainly in the days ahead, until we have many, many more being turned out we're not going to raise that percentage very much. I would submit to you that it may not be necessary. Let's examine this thing. It may well be that the M.A.T. that is now being developed in a number of universities in preparation for high school teaching has real possibilities so far as the college is concerned, particularly the lower division of the colleges, the freshman and sophomore years. It would make a great deal more sense, I think, to have a well prepared person at the Masters level for some of these teaching jobs, and for some of the functions to be performed in our higher institutions.

We're going to need specialists of various kinds for the different areas. We know this now, and we recognize it, in a way, that some people are good researchers. They should teach very little, or if they teach at all, they are most effective when they are working with a very small group of advanced students. There are other persons who don't do very much in the way of published research but who are actual scholars in their field and who would do a great deal in the way of integration of the results of research that is done in their fields. They are interpretive scholars. We need these people. We have some of them. And then there is the person who is really the teacher, who is a consumer of research and scholarship but who doesn't pretend to produce this himself. He confines his efforts to the instruction of students. If there are these different jobs to be performed, let's recognize the possibility of different kinds of preparation for these people.

If we are to serve these numbers with anything like a reasonable measure of adequacy, we need, I think, to make much better use of the faculty members in the days ahead than we have in the past. The highly wasteful procedures that have been employed ~~and~~ are still employed in many institutions. We need, I think, to recognize that the master teacher, through various devices, is going to have to be in a position to reach much larger numbers of students than he is able to reach in the traditional classroom situation. I think we need to recognize that it is a mistake to limit the advanced scholar. Unlike European higher education, we frequently do this in American higher education by limiting the advanced scholar to work in only the advanced areas of his specialty. The students in the elementary classes should have some contact with these scholars too. The way in which we can do this, of course, is through some sort of team teaching situation in which we utilize the services of our younger staff members, working on a team under the direction of a mature scholar and an experienced teacher in their field. These teaching teams might even include advanced students. Some institutions are doing this now. We're going to have to make more use of advanced students. There we have an attitude that needs to be overcome, an attitude that grows out of some things we did wrong in the past. The use of graduate students to teach elementary courses in our universities has been a scandal for a long time. Well, now there's nothing wrong in the use of advanced graduate students to teach elementary courses. It's the fact that they have been turned loose in the classrooms, in many cases, with little, if any, guidance. This becomes a job of secondary importance to them. Their main work is the completion of their degrees. As I said, many have had virtually no supervision. They have been looked upon as cheap labor. This is the wrong way to approach it. Now exactly the same kind of thing can be done and these same people can be used - and I think very effectively - if the objective is one of providing a good experience of an internship character for these people so that this experience can be built in as a part of their preparation for college and university teaching. Under the close guidance of the masters in their fields, this will produce quite a different situation, and I think a very satisfactory situation, for our students in the colleges and universities.

I think that we're going to have to make more use of independent study, and I refer to the kind of independent study that is highly costly in terms of faculty time. Not the Oxford tutorial type of situation, but real, independent study in which the faculty members are available as resource persons.

You know we've been saying this for a long time. We still don't do very much about it even at the graduate level. I think it's high time that we put a little more responsibility on young people in our colleges and universities to get an education for themselves and that we spend a little less time in trying to feed it to them. Even at the graduate level we make this mistake, and if you need any evidence of the fact that we're doing it, note the difference that you frequently encounter in an advanced graduate student at the doctoral level between the record that he makes in his course work where he absorbs what he hears and gives it back and what happens to him when he's turned loose with his research. You frequently don't recognize him as the same man, because he has, up to this point, had virtually no opportunity to be independent in his search for knowledge. He begins to learn this at the point of submitting his proposal for a dissertation at the doctoral level. This is a crime. We can start this kind of thing very, very much earlier. Have faculty members available as resource people, but don't expect them to spend the amount of time in class and in direct instruction that we have in the past.

One other comment, or series of comments, relating to how we may deal with this problem of expansion and growth in the days ahead. That concerns this matter of the clarification and limitation of institutional function at the higher level.

As the variety of jobs to be done in higher education increases, we have, I think, a very great need for institutions to recognize the need for limiting their functions, their proposed goals, to those things that they can reasonably be expected to accomplish with the resources available to them and the resources which are likely to be made available to them. We suffer in American higher education from the attempt on the part of education to be all things to all men. Somehow institutional prestige is gained, apparently by extending the range of offerings, by involving the institution in more and more things. It's a part of the American idea that the bigger and more complex you are, the more prestigious you are. In this day, when we are, indeed, in a seller's market in higher education, institutions could decide with some definiteness on some limited sphere of activities - these things we shall do very well, and these things only. We shall not try to do everything that everybody asks us to. It would be possible today, to a degree that it's never been possible before but the curious thing is that we're responding in quite the opposite fashion. The competitive situation among institutions is greater, it seems to me, than it was before. The more students there are available, the more competitive these institutions become. This sounds like kind of a jaundiced view of things, for this is only true in part, but it's true in enough cases to be disturbing.

If one's neighbor moves to the masters degree level, then one must move to the masters degree level. If one's neighbor then moves to the doctor's degree level, then one must also move to the doctoral level. If one's neighbor opens an extension center in Podunk Crossings, then one must also open an extension center there. You see, in Podunk Crossings, there's too much of this kind of thing going on. This again is a question of attitude. Just how this attitude is to be changed I haven't the slightest idea, but I think we ought to be conscious of its existence and do what we can to work to alter it. This is a hard one to deal with.

But it is still true that too many institutions do think in terms of this kind of prestige, rather than in terms of doing a limited number of things very well. It's an interesting thing that some of the strongest institutions are those that are not ruled by these so-called demands and pressures to extend their offerings to extension centers and upward to graduate levels, etc. A characteristic of some of the very strongest institutions is the reluctance to take on these additional jobs. These institutions don't need this kind of prestige. They have a different kind of prestige. They're not going to gain by extending or by expanding their efforts into other directions.

I think another thing we're going to have to do if we are going to deal with the manifold needs of society in the days ahead adequately, as far as higher educational enterprise is concerned, is to recognize, in deed as well as in statement, the fact that there are different kinds of quality. We still think in terms of quality in higher education, but when we think of quality, we think of achievement of superior students, highly verbal students, who show up well in the tests, in a college which is restrictive at the point of entrance. This we think of as quality. This is quality education, but unfortunately, we don't think quite as highly of a quality program in a technical institute, for example.

We've got to recognize that the important thing about preserving quality in higher education and preserving quality will be a real difficulty in the days ahead, is that quality must be judged in terms of purpose. The only definition of quality that is defensible in the world today expresses the idea of quality in terms of how well you do what you are trying to do. If it is to prepare electronics technicians and you are doing it well, then you are a quality institution. You are just as much a quality institution as the strong, highly selective liberal arts college is a quality institution. In fact, it is much better to be a first-rate technical institute than a third-rate college. Now this, of course relates to our whole system of values. What kinds of things do we value in our society? We have some pretty definite priorities, as you know. And a philosopher, even if he's mediocre, is up high, and the plumber, even if he's top-notch, is down quite a ways on the scale. Now what we need, of course, is what John Gardiner pointed out in that excellent little volume of his entitled "Excellence" which probably all of you have read, in which he pointed out that quality could only be related to the success with which you did what you were trying to do. It was important in society that we have quality in all phases. That is, that all the people who are serving the society in various respects must be quality persons. He said a society, to paraphrase him, needs both good philosophers and good plumbers, and that unless it has good philosophers and good plumbers, neither its pipes nor its theory will hold water.

These seem to me to be some of the things that we face in the days ahead. Though I have not offered here any highly explicit solutions to these problems, I hope I have conveyed to you the thought that we've got to change some attitudes on some of these matters.

WHAT CAN TV DO FOR THE PROBLEMS CONFRONTING EDUCATION?

The Instructional Quality Problem?

But television cannot convey the peculiar chemistry of the teacher and pupil inter-action in face-to-face teaching - can it? This question assertion has echoed and re-echoed off the ivy-covered walls and bounced about the terrazzo of school buildings across the land. It has been played and over-played in concert with others concerning student motivation and over-emphasis on impersonal hardware until a symphony of doubt has been played and listened to through far too many uncritical ears.

Today the symphony is discordant. It is being replayed, still, of course, but played mainly by those who haven't taken the time to find out the facts.

Early experimentation by the armed services in the realm of film and other educational media moved quite naturally into the new possibilities of television. The army's many widely divergent educational tasks, from basic training to specialized skills, were taught experimentally by television under carefully designed and controlled conditions. The learning results favored the television presentation, and with variations which permitted review, via kinescopes or video tapes, television clearly produced improved learning.

A survey of teaching experiments via television numbering several hundred, conducted by Wilbur Schramm, Director of the Institute for Communication Research, produced the conclusion that in a majority of the research situations the results showed no statistically significant difference in the learning resulting from the television experience when compared with conventional teaching methods. Some (21%) indicated better results, and some (14%) worse, but the preponderance (65%) demonstrated no significant difference.

Schramm was quick to point out that the experiments did not measure the "intangibles" of television teaching versus "ordinary classroom teaching." Some differences in the effectiveness of television teaching versus conventional methods did show up in terms of differences between elementary and high school and between high school and collegiate levels. Different areas of subject matter produced different levels of effectiveness, too, but none of these were of a significance adequate to destroy the general conclusion as to teaching effectiveness via television.

In the early days of applying television to education, those who pioneered repeated over and over again that the instrument did not threaten the teacher with technological unemployment. But echoes of the early apprehensions can still be heard, though the protest is somewhat more refined. Television does promise a re-adjustment for the teacher in many instances, whether the teacher is doing the teaching by television, is participating as a learner and a teacher in the use of television teaching by another teacher, or is a part of a teaching team both teaching and using the teaching of others. This adjustment continues to frighten some teachers, but those who have had the experience soon begin to see that the appropriate use of television holds every promise for doing an even better job for the individual student.

Very little research has been done on the processes involved in the adoption by a society of new methods and new things, but television's adoption by education should offer many situations worthy of research attention. The educational administrator who hesitates should inquire into the qualities of contagion which the use of television injects into a school system or a college. Resistance is replaced by curiosity, and even in the rational realms of education a little accurate information and experience gives reassurance and confidence. One teacher infects another with the possibilities. Virtually every teacher, consciously or subconsciously, strives to do a better job of teaching in television. Television at one educational level suddenly attracts interest at another level, and so on.

The wise administrator soon recognizes that television might well justify the investment if only in terms of the extension of conventional teaching via television. However, inherent in the instrument itself is a stimulation toward improved instruction, and, given sufficient supplemental aid through other educational media, television becomes a positive force for more effective instruction.

No administrator, school or college, can turn his back on that prospect. Nor can he fail to note, if he will take a closer look, that the array of other tools of teaching - the books, the blackboard, the projectors, the maps, the felt boards - have all appreciated in their teaching value because the new instrument, television, has merged one and all into a single concept. It is the educational media concept.

Television can't approach its potential without the other educational media, and they cannot achieve their fullest potential without the powers of the new instrument to give immediacy, flexibility, and a new efficiency in the organization and use of all the media for teaching.

With its power to extend teaching, its power to record and store teaching, instructional television quietly demands the best from the teacher. And, then, the teacher becomes more aware of the use he can make of the tools he has at hand, as well as the shortcomings of the materials which are available. Such discoveries are the things of which the administrator's nightmares are made, perhaps, but when the night is past, the dawn is that of a new day in teaching effectiveness.

These same powers then make possible the incorporation of the best into the individual lesson, into the teaching unit, or into the course - not alone the best that can be done by one teacher, by the faculties of one school or one system, but the best that has been done to date by any teacher anywhere. What then does this mean for the curricular horizons of the individual school or system? They expand beyond the fondest dreams of the teacher, the principal, the superintendent, the dean, the president and the governing board. The weakest points in the day's lesson, the course syllabus, the vacuums in the curriculum may now be strengthened and filled in. The talents that couldn't be found or employed, for lack of funds or the right teacher, are suddenly within reach. Institutions swap their best talents, supplement each other's offerings, exchange courses, and jointly build upon each other's teaching and curricular strengths.

That same dawn brings with it a new realization of the powers of the new instrument to carry information of importance in other aspects of the total educational process outside the classroom lesson. Orientation of students, from sixth grade to junior high, from high school to college, or between other rungs in the graded ladder can become a function of television. In-service training, one-way observation as a teaching method, and other information processes - even inventory information and control - may occupy the off-classroom hours of the television system.

Yes, there are shortcomings, but they are not questions concerning the capacity of the instrument to transmit educational information, but, rather, questions concerning the information the instrument is to carry.

As one experienced hand among the pioneers of educational television has observed, the instrument can spread mediocrity as fast as it can spread the best that can be produced. But the mediocre messages which have been dispatched via television and those that will be carried in the future are not and will not be creatures of the instrument itself. Rather, they will be the products of the limitations of those who use it.

No school or system, no college or university can ever hope to have the best of everything. The happiest prospect in instructional television and general educational television is that all education may scale the barriers of its parochial tendencies to recognize that which is better and seek to bring the best to its task.

Silhouetted on the horizon are national and regional libraries in which the educational materials of television may be evaluated, stored, catalogued, reproduced and made available for use in supplementing the basic offerings of any school or institution in the land. The availability of such services need never raise a fear of conformity, or uniformity, for the materials will be supplemental to the educational foundations provided in the individual classroom or teaching situation. And, that which may be judged better or best today will forever be challenged by the constant movement of knowledge, newly discovered knowledge and the creativity of the individual teacher who is always searching for the new and better way.

INSTRUCTIONAL TELEVISION

GENERAL RESEARCH FINDINGS AND MILITARY IMPLICATIONS

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Television research in its infancy was largely supported and conducted under military auspices. This situation reflected the high cost of television research and the eagerness of the Armed Forces to explore any promising means for meeting its continuing shortages of qualified instructors and the need for improvement of military training.

There was never any shortage of people who thought that television could be a valuable medium for teaching. In reading the proceedings of seminars and meetings which occurred in those earlier times, I am continually struck with the similarity of the predictions and statements made in those days with those current today. There remained, however, the important problem of translating these predictions, beliefs and hopes for television into reality.

One of the earliest studies in the field, jointly sponsored by the Army and Navy, was carried out at Fordham University. One of the objectives of this study was to determine the influences of different types of instructional television treatments upon the amount of learning achieved. A series of lectures was presented by television on various military subjects to military students. These students had been given a pre-test to see how much they knew about the material beforehand and then tested after the television instruction to see how much they had learned.

One of the features of the study was the classification of the techniques of presentation used in the television instruction. When the subject matter was treated by actors in dramatic sequence, the type of treatment was classified as drama; when an instructor presented information in the form of a lecture, the treatment was classified as narration. And there were three other categories of treatment each of which represented some combination of narration with drama or atmospheric film.

An analysis was carried out to determine student learning achieved under these five categories of television presentation. To quote the investigators at this point, "The data of this study has suggested that direct narration is much more effective in producing learning than is dramatized action." Unfortunately, to my knowledge, this was the last time that this question of the effects of various types of television presentations, particularly dramatic presentations, was investigated. If the results of this early study are reliable, then think of the implications they have for many of our current attempts at presenting educational materials over TV. Think of the questions it must raise, for example, as to the effectiveness of presenting language instruction through the use of puppetry. Think of the implications for the use of cute animation or "entertaining" approaches to television learning.

In the early 50's, both the US Air Force and Army independently assembled mobile television units. These units, consisting of cameras, receivers and kinescope recorders, visited military installations and demonstrate possible applications of television in military training. Reactions were solicited as to the estimated value of these demonstrations and they ranged all the way from "no value" to "has exciting possibilities." But there was no consistent pattern in these reactions nor could they be translated into any meaningful use of television. There were many questions raised about the possible effects of television upon student learning which these demonstrations were not designed to answer.

Finally, in early 1953, the Human Resources Research Office, George Washington University, of which I was then a member, and which is an organization performing research for the Army, was asked to design a study which would provide objective reliable answers to certain questions. The major question asked was, "How does television compare with current Army instruction with respect to teaching effectiveness?" And so, we had the beginning of what is the first, or possibly the second, study in this field concerned with this question. We did not anticipate that in the ten years to follow, this question would be re-examined at least 300 times in about as many studies. We also evaluated for the first time the use of television for teaching manual skills, and the effect of using kinescopes as a review or refresher procedure. The area of Army basic training was selected because it represented a very important training responsibility. Seventeen hours of instruction were selected and trainees, matched for aptitude, received either television or regular instruction in these 17 hours. Then they were tested to see how much they had learned. Television instruction was as faithful a duplicate of the classroom instruction as was possible or reasonable. The results indicated that television was at least as effective as regular instruction when the overall performances of the various groups were compared. However, closer analysis of the results indicated that for particular types of learning, where recognition was involved, or understanding of relationships among moving parts, or rote learning, television instruction was more effective. We also found that low aptitude personnel learned better from television than their counterparts did from conventional instruction. The higher aptitude trainees appeared to learn equally well from either conventional or television instruction.

An interesting finding was that television could be used to teach a skill as involved as disassembling a machine gun. One of the dramatic episodes in the study for me was watching several hundred men as they followed a television instructor step by step in the disassembly of this weapon. For this particular instruction, the television group did better than the conventional group in terms of speed and number of errors. Some groups of trainees received several hours of kinescope review toward the end of basic training. This instruction was a film recording of the original television instruction given eight weeks earlier. Our purpose here was to observe the effects of a review of this type upon trainees learning. We found that trainees who had not received this one review, regardless of whether they had originally been trained by conventional or television means, had shown losses of 50 percent or more in the learning they had achieved eight weeks earlier. But those who received one review by kinescope suffered no loss and in some cases did better than their previous achievement of eight weeks earlier. We were successful in demonstrating that through the relatively inexpensive use of kinescopes the effects of trainees' forgetting could be overcome in this military training situation.

While carrying out this study the investigators noticed that they had difficulty in keeping the television instruction the same length as the conventional instruction, which was a requirement of the study. One apparent reason was that television cameras strategically placed could reduce instructor walking and pointing time, and this alone might add up to five minutes in a 50-minute instructional period. We also felt that if we were given the permission to take the wraps off television, that is, use it in ways we thought might be effective, we could reduce teaching time and/or improve the level of instruction. Subsequently we were given permission to try to achieve these goals.

This time the subject matter was transferred to the field of basic electricity, because subject was typical of that taught at many military schools, and there were difficulties in teaching many of the abstract concepts found in this area. My experiences in the second study have forever colored my perception of the problem facing anyone who attempts to improve instruction. We selected four hours of instruction in the basic electricity course. They were chosen because, on the basis of student performance, they were described as the most difficult to teach.

We worked on these four hours for about 3 months, and we tried everything. We used television to visually reinforce key points of instruction. We used student participation, in which the students either wrote down or called out, at the beckoning of the television instructor, various items of information. We used review. We simplified language. We eliminated what we thought were confusing analogies. We wrote, rewrote, retested and re-televised the instruction many times. The sum of our experiences may be described as follows. We finally produced four hours of improved instruction which was shorter, ranging from 20 to 50 percent shorter in terms of time, and at least as effective or somewhat more effective than the original four hours.

I think an important major conclusion from our efforts was this: We were never sure and could never guarantee that each succeeding change made in the instruction would, indeed, be an improvement, that is, result in increased student learning. Sometimes the first attempt at improvement was the only successful one. Five or six revisions later we might not end up with a more effective instruction presentation in terms of student learning. At another time the fourth out of a series of six was the best, and so on. Our results were entirely empirical in approach and conclusions, and I emphasize this point here, because I want to make note of it a little later on. It was at the conclusion of this study that we decided to try something novel.

We had been hearing from various sources of what the qualifications of a good television instructor should be. These included such obvious qualifications as knowledge of subject matter, a ready smile, a quick wit, and so on. We had been working with prompting equipment and our lessons were in prompter form so that they could be read by anyone standing in front of the television camera. We selected an enlisted man who had never taught before and had no knowledge of the material with which we had been working. We rehearsed him a number of times until he could read smoothly and convincingly from the teleprompter the content of two of the hour-long presentations on which we had been working. We already had test forms and test results on the performance of experienced instructors teaching students this same material. Now we permitted this relatively inexperienced instructor, who had been given a few rehearsals, to teach two of the hours to other students. We tested the students, and we found they had learned just as well from him as their counterparts had from the experienced instructors.

In succeeding years, as part of our Army television research program, we conducted additional studies. One of these was a follow-up of the last mentioned finding in which we trained three inexperienced men to teach 15 hours of basic electricity over a period of three days. Again when we tested the students, we found that they had learned as well as their counterparts had learned from experienced instructors. A novel effect was the finding that while the students were able to pass the test, the new instructors, when given the same test, failed to do so. As part of the same study we taught students by television over a three day period, 6 hours a day, to see whether there was any fatigue effect or any decline in learning due to such intense exposure to television. Comparisons with students trained an equal length of time by conventional instruction revealed no differences in the learning achieved.

It was in 1957, shortly after the advent of video tape recorders, that a study was established at Fort Monmouth to determine the effect upon instructor training of recording and immediately playing back on video tape segments of their instruction. The study was never carried out. It proved so successful during its initial stages, in terms of instructor improvement, that it was adopted as a standard training technique by Fort Monmouth, and it is still in use both there and at other Army schools. In 1959 and 1960, we carried out two studies to determine the contributions to learning, if any, of instruction presented by color television as compared with the same instruction presented by black and white television. Using a variety of subject matter, we were unable to find evidence of any differences between the two ways of presenting instruction. As a result, with the exception of medical instruction, color television is not now employed by the Army for military training. It is interesting to note that even in the field of medical instruction, there is a decreasing use of color television as compared to black and white.

Our most recent study was completed last year, again in the area of basic training. Despite the first Army explorations in television in basic training, television was never again used in that area. Instead, 8 of our technical schools, which teach such subjects as electronics, missile maintenance, food preparation and medical instruction were given priority in acquiring and using television. But as a result of the Berlin Crisis and the mobilization which followed, the critical shortages of instructors and training aids which prevail in basic training became further aggravated. Permission was received to again try out television in basic training but on a fuller scale than in the 1953 study. This time, about 60 hours of instruction, which represented most of the formal classroom instruction in basic training, was converted to video tape. Over an eight week period, a basic training company received all of its classroom instruction during the day by this means. In addition, we tried out a new technique in which television was installed in the barracks of these trainees. Every night, by means of video tape recordings, they received additional television instruction of the following types: 1) A review of previous instruction, and 2) A preview of forthcoming events, with the hope of reducing anxiety and improving performance in these events by showing the trainees in advance what was in store for them. The results indicated a very favorable effect from these uses of television. Not only was the test performance of the television trained company much better than conventionally trained companies with which it was compared, but the performance of the lower aptitude television trained personnel was at least as good as that of the higher aptitude conventionally trained personnel. We suspect that these improvements were due to the constant review and preview presented by television after hours. I take particular pride in these results because it is not very often, despite whatever techniques are used, that you get important differences in favor of an experimental group whether it be in television, programmed learning or what have you. As a result of these studies, the Army began installing closed circuit television facilities in many of its schools. Many years before most of our present civilian television activities, thousands of military men were trained by television in a variety of subjects. These included lectures, demonstrations in various manual skills, such as radio repair and typing. In these latter skills, the students, with the equipment before them, followed the instructions of the TV teacher. The problem of interaction between students and TV instructor was met and solved a number of times. Sometimes the finding of our Fort Gordon study, to the effect that eliminating question and answer opportunities did not appear to impair student learning, was accepted. At other times, a two way intercom system was installed. After a few weeks or months, when the triviality of most questioning had been sufficiently magnified and demonstrated by this procedure, the system was removed. The variety of military uses includes replacing individual hours of instruction completely by video tapes, or using television as a supplement to ongoing instruction. Another use involves presenting entire course segments by television rather than selected scattered hours. About 1959, both the Air Force, and Navy, began increasing their use of television for training. Today there are about 25 Armed Forces television facilities, and I would expect another ten to be installed within the next two years.

For many years military television studies dominated the field. Later, the Ford Foundation, and, of course, the Title VII program began to provide funds and support for the conduct of other studies. Many of these studies confirmed the results of previous military studies. More frequently, the finding was that television was at least as good as conventional instruction. Despite the criticisms of many investigators, this type of comparison continued to be the most popular exercise in television research.

In the past 15 years, there have been three major audio-visual research programs. The oldest and most extensive was supported by the Navy Special Devices Center, aimed at developing and improving the use of films for instruction. At about the same time, though for a shorter period, the Air Force maintained an in-service research activity with a very similar mission, and most recently, there has been the extensive Title VII program. The three programs deserve to be considered together because if anyone had sat down and analyzed the two older programs, it might have resulted in avoiding many of the deficiencies in the present Title VII program.

The older Air Force and Navy research programs had one asset. They reflected or were under the direction of one person who was in a position to at least give some direction and continuity to the entire program. One of the defects of the two older programs was the disjointed succession of studies they carried out. Fragmentary hypotheses were studied perhaps once, rarely twice. There was little or no follow-up on promising results, and both programs were characterized by an almost complete lack of any theoretical unification. Not that there is anything wrong with a completely empirical research program. It should, however, have the characteristic of pursuing to some depth a particular hypothesis.

The research supported by the present Title VII program has the following shortcomings:

First, the program lacks central drive and direction. It has been hampered, partly by legislative directive, by a committee system and by a diffusion of authority and responsibility which is reflected in the types of study supported. There does not appear to be any systematic pursuit or development in the studies I have seen. One investigator or group of investigators, for example, who under this program have conducted a series of studies, pursue a different problem with each study. Another defect lies in the nature of the reports themselves. The reports are not easily available. It is true that there are microfilm and exchange channels available. Under the older Navy Film Research Program, for example, the reports were easily available to interested investigators from a central source. To this day, if you were to write to the Navy Training Devices Center, Port Washington, N.Y., you could still receive the large bound volumes of these reports. A similar distribution of reports from a central source, such as the U.S. Office of Education, would in my opinion result in freer access to these reports than is now achieved.

The reports, many of them, are an abomination. They are poorly written, employ obscure terminology and seem to be an exercise in preventing the reader from finding out what happened. Very often, after you have plowed through a verbal quagmire, you find out that, after a pretentious introduction and a complicated and often naive experimental design, the results indicate no differences among the methods or procedures or techniques under study. And the experimenters seem embarrassed that their mountainous labor has produced these results. So they contrive very often to obscure them by using phrases which are familiar to many of you in this audience. "There was no significant difference between the experimental and control group, but the scores of the experimental group tended to be higher." Or, "while the results were inconclusive, the sampling of instruction was limited. It is felt that with a more representative sample and the following changes, etc. etc." Unfortunately, this future study is rarely if ever carried out.

One active field of research lies in the area of programmed learning. I mention it here because of the number of recent proposals for combining programmed instruction techniques with the television medium so that the effective instructional techniques of programmed learning could be widely disseminated by television. Unfortunately, while the ability of a television to disseminate information is well proven, the ability of programmed instruction to improve learning is not. Programmed instruction is an expensive, time consuming approach to improving student learning. It features an elaborate terminology, complicated techniques for organizing material as well as esoteric conceptions of the nature of the learning process. All of this is unimportant. What is important is the answer to the question: Does it work? Does it improve student learning? The answer is,sometimes it does, most often it doesn't. You may recall my earlier description of our efforts to improve four hours of instruction in basic electricity. We never were sure that any of our successive efforts at improvement would be better than the previous cases. Those who used programmed learning techniques are in the same position. Very recently the Division of instructional services at the Pennsylvania State University issued a research report describing the results of several studies, one of which was a comparison between "the relative effectiveness of a programmed course in English grammar presented over television as compared with the same content taught in the usual way by an experienced teacher." The results indicated no difference in performance between the two treatment groups, and then there follows, what I think is a curious conclusion: "that students can and do learn as much by programmed television presentation as they do under normal face to face or conventional instruction." I think this conclusion misses the point entirely. What the results indicated, and these results have been substantiated by other investigators, is that despite the costly and laborious conversion of a course of instruction to a programmed format, students learned no more than they did from a conventional unimproved presentation of this material made at far less cost and with the use of less complicated techniques. In other words, who is kidding who? Do we justify the acceptance of a difficult and expensive method of instruction, because students do not do any worse with it than they do with existing means of instruction?

As you can guess, I am just warming up to this subject, but within the time allotted to me I am only able to touch upon a few critical areas.

I have attempted to describe some of the studies conducted by military researchers and some current uses of military TV. Finally, I have made some critical observations of the current status of research in the audio-visual field, particularly that sponsored under the Title VII Program. It was not my intention to make the Title VII Program the depository or the major cause for long term deficiencies in audio-visual research. I am personally acquainted with the key personnel, and they are an overburdened group, who monitor this program. But the Title VII program represents the answer to a long term demand and need for research support in the audio-visual field, and if a program of this scope fails, it will be a major setback to the entire field.

CURRICULUM AND TELEVISED INSTRUCTION

T. H. Broad, Supervising Coordinator of Instructional Improvement

Oklahoma City, Oklahoma

Every school system has some kind of learning experiences for children. In some schools this may be a rather rigid prescription of learning experience. In other schools the program may be based on a statement of objectives and general procedure called guides. Some school systems prepare and provide resource units for the teachers. Others develop courses of study. The approaches to curriculum all depend on the manner in which the teacher approaches the teaching of children with the suggested material content at hand. Whatever the pattern in a school may be, it is the teacher who is the prime motivator of learning.

Some school systems believe in rigid structuring, others in flexible structuring. Rigid structuring may set limits on the learning while more flexible programs may be rich or impoverished as to quality of learning, depending on the understanding, imagination, and resourcefulness of the teachers.

In developing the curriculum for use by educational television in Oklahoma City, the original steps were made by the schools administration. Certain inadequacies were identified in the learning experiences of boys and girls which could best be met through the use of a master teacher using the medium of television to reach a larger number of boys and girls. The administration secured the equipment necessary, employed the teacher and production staff, and immediately proceeded to offer certain courses in science and mathematics at the high school level. In the beginning, these were rather traditional type course offerings and were projected into the classrooms with little or no preparation on the part of the classroom, or receiving, teacher. Experience soon showed that much thought, planning, and preparation must go into courses being taught by television. Classroom receiving teachers and TV teachers were brought together to determine, to the best of their ability, the course content. These committees developed a course guide which would be used by the television and the classroom receiving teacher. It became the responsibility of the television teacher to determine, with the help of the production staff, how best to present the material over television. The committee also assumed the responsibility for developing suggestions for use of the telecast in the classrooms, for adequate preparation for the days telecast, then planned further suggestions on how the classroom teacher might follow-up the telecast. These were prepared and put in the hands of all receiving teachers. As a part of the Oklahoma State Educational Television Program, the receiving teachers received the guides which had been prepared, but they had no voice in their preparation.

As we gained experience both in telecasting and receiving, it soon became evident that we must seek outside resources if we were to improve our offerings. Fortunately, there soon became available the Harvey White films in physics and the Baxter films in chemistry. We were most fortunate in Oklahoma City to have a young man who is a master teacher in mathematics who was willing to leave the classroom and develop television courses in algebra, geometry, matrix algebra, and math analysis. Two things developed from the use of the films and the use of the live teacher. It soon became apparent that our chemistry and physics teachers needed to be informed of the new approaches and the new concepts being developed in these areas. It became necessary in the case of the chemistry films to ask Mr. Baxter to spend two days with our chemistry teachers developing with them his philosophy and purposes in the new chemistry. In the case of the mathematics teachers, the Mathematics Council sent a committee to the Administration and asked for some special help in the form of consultants to help them learn to teach as the television teacher was teaching.

A special consultant was flown into Oklahoma City on six Saturdays and met with a large group of mathematics teachers and with the television teacher to develop the new mathematics. As a result of the success of the television teaching of science and mathematics, additional courses at lower levels were offered such as scientific geography at the seventh grade, physical science at the eighth grade, and living science and biology at the ninth grade, and Science Seminar at grade 12. A course in United States history was developed as was a course in state history.

At the present time a program designed to help orient sixth graders to junior high school is being used. Another program has been developed in cooperation with the nearby colleges for the benefit of high school students. The program is designed to help acquaint high school boys and girls with some of the information they need about colleges and what is expected of students as college freshmen.

The curriculum planners then turned their attention to the elementary school. As a result of the feeling of success at the secondary level, it was decided to offer elementary school music, elementary school art, some elementary school social studies, and later conversational French and Spanish. As the school system became interested in the new mathematics at the elementary level, it was decided to introduce this new mathematics to teachers and children over television. It was offered the first year to grades 3 and 5, the second year to grades 4 and 6. As a result of this experience, we learned to use television certain mornings of the week, before classes began, for in-service education of teachers who were teaching the new courses in the languages and the new mathematics at the elementary level.

Two more interesting curriculum developments appeared at this time. A teacher of commercial art was employed to teach shop drawing at the high school level. He was doing this successfully when we discovered that the elementary classes were watching this T.V. teacher and following him carefully and with success. This resulted in the changing of our offerings at the elementary level to include television lessons in drawing. These have become most popular with pupils and teachers. A second interesting development appeared after the senior high school principals had requested a program for physical fitness and conditioning to meet the needs of high school athletes at a time when their sport was not in season. Again it was discovered that children in elementary schools were watching and participating. Now physical fitness, as well as health and hygiene, is offered to the elementary level through the use of television.

Since the resources were available, and the summer schools were growing by leaps and bounds, it was decided to experiment with the teaching of typewriting by television. This proved to be quite successful.

Our experiences would lead us to believe that wherever possible the course planning should be done by classroom teachers and the teacher who would develop the course on TV. It is interesting to observe in receiving classrooms how we structure both rigidly and flexibly and what happens to a class of boys and girls who are receiving television in the classroom. The television provides a one-to-one personal relationship; there has never been any problem of attention on the part of pupils or students. The discussion which follows the telecast provides for the flexibility, but also forces a different kind of approach on the part of the classroom teacher. This has made it necessary for the classroom teacher to be thoroughly informed of the purposes and objectives of the course, as the TV teacher many times offers suggestions for further inquiry on the part of the students.

Certain important points were identified as we attempted to utilize television in the curriculum: 1) It is important to involve teachers at the classroom teaching level in determining needed courses and course content needs. They must form a working group with the teacher who would do the telecast in developing a program which would include not only the telecast but the teaching guide for the classroom teacher. 2) Careful screening of content materials may cut down considerable busy-work and activities of little importance. The succinctness of the television presentation, which gets to the heart of the content material, provides a core around which the classroom teacher involves his students and stimulates them to further inquiry. 3) In-service training of teachers is important in whatever area they were working. This is especially true for the classroom teacher who may feel an insecurity in dealing with certain types of subject matter. It is also true in helping teachers to gain security in certain methods of introduction and presentation of new subject matter. 4) Consistent and continuing evaluation of the television presentation as well as its contribution in the total curriculum is important. 5) It must be recognized that certain courses are best done through direct teaching via television, while other uses of the television supplement and offer considerable enrichment over and beyond the general course content.

In conclusion, as we have worked with the medium and evaluated our experiences, we have become more and more convinced that at this time we have merely scratched the surface of the potential of educational television. It is our hope that more and more research will uncover new and better ways of production, that more experimental work will be done in other areas of the curriculum, and that we shall all be constantly striving to improve not only our television production, but improve the curriculum as a whole in light of current changes in our culture.

UTILIZATION OF ITV MATERIALS
IN
THE CLASSROOM AND ON THE CAMPUS

Theodore Conant, Consultant, Classroom Television
Film Board of Canada, Montreal, Canada

An historian seeking to describe the birth of instructional television in this country might well say that the medium was fostered by a series of explosions, increases, and shortages. As a result of these upheavals, our schools today are suffering standard American agonies, critical attacks, self doubts, loss of a sense of purpose. As a nation we have begun to realize that our educational system is a foundation stone of our national well-being. The current popularity of phrases like human resources, supply of trained manpower, and talent search indicate that we are beginning to value intellect and trained intelligence. But some genuine agonies accompany this new appreciation of education, agonies which are reflected in microcosms, such teaching tools as educational broadcasting in classrooms. For example, if instructional television is an important factor in common with all education and educational tools to our survival, then many critics argue it should be of paramount importance to ensure better quality of instructional television production and utilization of programs with more enduring substance, more carefully integrated in the total classroom experience. Others see instructional television playing a major role as education is increasingly bent to the national purpose. Education in their view ranks as one of the nation's vital defense industries devoted to producing sane manpower.

Fortunately, however, a contradictory view of the purpose of education still maintains its hold in this country, the classical ideal of liberal education built within the American framework of the comprehensive high school and the liberal arts college. These two viewpoints frequently colliding within the same person, cause much of the kind of confusion about the goals of American education in general, and the focus of instructional television in particular.

As I mentioned earlier, the medium was first widely adopted during an emergency, an emergency of manpower and school buildings. In the late 50's education was under great pressure to increase its productivity. Today, now that it is established as a full-fledged industry, productive efficiency on a cost per student and test result basis all too often has resulted in an undue emphasis of the wonders of new, efficient technology, rather than on what the machine can do to enhance the hallowed personal relationship between student and teacher. Things that are easily measurable tend to obscure the things that are more difficult to measure, but which people, like grown-ups, for example, feel are of utmost importance.

Teachers, of course, are well aware of all of this, and although some have come to see that the future may offer new and challenging opportunity, others are apt to be more cautious. They respond with hostility, opposition and overt or covert resistance. In the cast of instructional television, teacher reaction is largely dependent in the way the medium is exploited. If television is used only occasionally to bring to pupils a public event such as a session of the United Nations or special program on the new science or the new mathematics, the teachers' day to day activities are relatively undisturbed and his status is not threatened. Even the common, once-a-week series which is offered to enrich and supplement regular classroom instruction in a given subject raised few problems once the set or sets are properly installed, particularly if the teacher remains free to use, or not to use, each broadcast as he sees fit. He can generally continue his usual round of activities, squeezing in the television experience at the expense of some less fruitful activity. His syllabus and teaching plans remain unchanged. But, when broadcasts in a given subject are presented two to five times a week, as is typical of much present-day instructional television in this country, it cannot be accepted so casually. Major readjustments on the part of the receiving teacher are involved. The mere prospect of such changes in accustomed classroom routines is disturbing. And the question naturally arises on the part of the teacher about the quality of instructional television programs. Is the quality of instructional television worth the loss of valuable class time?

Even more critical, however, is the apparent threat to the teacher's concept of his basic classroom role. No longer is he the sole master of his little school empire. He must share his teaching responsibilities with the television teacher, who may indeed eclipse him in the eyes of his pupils. Most important of all, instructional television, directed to many classes of different kinds encompassing different abilities, necessarily limits the freedom of any participating classroom teacher by dictating broad outlines of subject matter, sequence of units and topics and a relevant time to be devoted to each. At its best, such direct television instruction can be relatively flexible and can be a strong and valuable adjunct to the classroom teacher. The necessity for careful planning, quality programming, and adequate orientation and in-service training, however, is all too obvious.

But these things cost money and tend to degrade a favorable cost-per-student ratio. As is the case also of course with quality instructional television programs, prepared with the experience of Europe and Japan and the United Kingdom, and even Canada, our cost-per-student ratios are low enough that we cannot spend the kind of money and the kind of resources that are being devoted to instructional television programming in other parts of the world. Above all, the television lessons must be worthwhile as I have just indicated. Instructional television surely must stand or fall in the quality of the television lesson itself. In many cases, the competent teacher, the teacher of excellence and imagination, opposes television not because of his reluctance to make use of the medium, but because of disgust and repugnance at the poverty of its programming and its failure to demonstrate what it can accomplish.

Instructional television, when part and parcel of the school curriculum, involves severe readjustments on the part of the classroom teacher. He is forced to surrender a measure of classroom autonomy for the advantage of better effectiveness in the presentation aspects of teaching. But if he can be led to redefine his role in highly professional terms as a manager of learning situations and of a counselor of learners, he will find a transfer of responsibility for much of routine presentation to the television lesson or to the lesson in combination with the television teacher as a means for providing more opportunity for handling group and individual learning activities.

If a television lesson is combined with other teaching aids and new, significant dimensions of learning can be presented to teacher and student alike, and the full characteristics of non-verbal learning can be exploited, hopefully, he will derive great personal satisfaction and fulfillment from teaching in this new and challenging way.

Let us now examine for a moment the present state of instructional television utilization as exists in this country. As a case study, I selected, the Dade County, Miami, Florida, school system. As most of you know, they are now operating two television transmitters. They have been in the instructional television broadcasting business a long time. Rather than present the case myself, as I am rather ambivalent about some aspects of the case, I am going to bring you via kinescope Dr. Hall of the Dade County system and Mr. Mitchell who will discuss the utilization aspects of the instructional television program at Dade County, in combination with their field workers, the people who go out and give the teachers actual field assistance. They are instructional television resource consultants.

(KINESCOPE)

I think the picture is fairly typical throughout the country except there is less emphasis on large classes in other parts of the country in general and there's less emphasis, I would say, in involving the pupil in terms of social dramas, discussions, and debates. In general, as I get the picture, there is more passive note-taking and less activity. Because they work within very, very difficult limits in terms of finance and within a limited range of possibilities the Dade County authorities have tried to involve students in a variety of activities. Nevertheless, as one goes through the classes and observes the students in action, there is a tremendous emphasis on putting down information on paper to be regurgitated at suitable intervals in the forms of tests, multiple choice exams, etc.

One can't help but feel that this is primarily education for the middle stream, not for the bright youngster, with an inquiring mind, and not for the underprivileged, but rather for the motivated youngster who will take his notes and put them on paper and memorize them and organize himself in such a way that he can dutifully inscribe the relevant facts at the appropriate times - people who will honor appropriate academic rituals. This is a real problem that I think we face in this country today. How to use the promise of various tools at our disposal, film, television, programmed learning, etc.? How to utilize them in such a way, to get at the other end of the educational spectrum, the one-fifth of our youngsters who will come from poverty-stricken culturally deprived homes, and the one-fifth, or one-sixth,whatever figure you want to use, youngsters who are above average ability, who in many cases now sit in frustration and boredom in classroom experiences. And who knows, some of these may also turn out to be potential Oswalds.

I would like to echo heartily what Walter Stone said about the Italian experience and about some of the experiments being done in France, in Japan, and in Italy. In the Italian experience and in the experience of Japan, in terms of rural schools, we can get clues and pointers on how to deal with these minority segments of the school population, and also how to deal with the adult population on the farm and in the city slum, in ways of retraining and retooling.

Here, of course, we have an illiteracy club. It's never too late. An imaginative extension program organized by the Italian television authorities which covers the entire Italian penninsula is a good example. They not only use television, but they use very imaginative follow-up devices in terms of other teaching aids, in terms of imaginatively organized printed texts. The programs themselves are produced not only using simple, inexpensive visual aids, such as the overhead projector, but they use drama; they use comedy; they use Buster Keaton, and mud pie type skits. They are made entertaining so that people who are not used to receiving information in an organized fashion can absorb and become involved in an educational process.

There is another significant aspect to the European experience and to the Japanese experience which has great promise. It is a coordinated system of producing and distributing materials that are very closely keyed with the instructional television lesson, using overhead projector transparencies in some cases, more often, simple things like short film clips and some of them are getting very interested in the 8mm thing. Of course there is experimentation in the United States and Canada along the lines of using the 8mm cartridge in combination with television, and, to a very large extent, using slides and film strips. Time does not permit an exploration of this subject, but I did hope to show you, for example, the kind of thing that NHK is doing in terms of producing colored slide sets on Japanese history, or that the Netherlands are doing. They've been doing this for a long time in terms of radio-vision experiments. They have a technique developed very heavily on the Continent and in French-speaking Africa of using simple, inexpensive film strips especially keyed to radio broadcasts. The experience gained in developing this business of radio-vision is now being applied to television.

In Canada, the National Film Board, and CBC, are collaborating on a series with the hope that they may very shortly produce a series of still pictures which will be used in black and white on television and then distributed in color via film strip form. There is one experimental series in the life of the Eskimo. The color transparencies are of excellent quality and provide not only non-verbal information in terms of the Eskimo, but each color transparency is almost an aesthetic experience itself. Incidentally, there are no captions over these transparencies. You look at the picture frame by frame, with occasional separate caption, but this is not the usual set of film strips where you have typed script messing up the non-verbal part of the presentation.

Over 125 years ago a New England educator and scientist, Marshall Conant, was concerned with the development of teaching aids in the field of science. At that time he wrote as a preface to a slim volume, "It is the desiring of the author to treat science generally and to exhibit its various principal departments in that order and connection in which the uninitiated would seem naturally to acquire a clear understanding of it." 137 years later we are still exploring this vast, and yet really unmapped, frontier.

We have been discussing here some of the exciting technological developments and possibilities in terms of equipment and hardware and organizations. I submit to you, there are many other dimensions to these problems with which we must also cope, and not the least, the human dimension, the classroom teacher, the way in which she can use these machines to creatively explore the minds of the students.

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SHARING INSTITUTIONAL INSTRUCTIONAL RESOURCES

James S. Miles, Director

WBAA Radio-TV, Purdue University

Some one once said cooperation is only as good as the cooperators. This I expect is true. Certainly the cooperators working with the committee on instructional television of the Committee on Institutional Cooperation have been indeed good cooperators. This group which has been active now formally for less than a year is meeting regularly, exchanging volumes of material, has completed a survey and in general has stirred up more activity among CIC institutions than anything the CIC has done in its relatively short life time.

The Committee on Institutional Cooperation of the Big Ten and the University of Chicago was formed in 1958 at the insistance of the Presidents of these institutions who saw the need for an even larger educational complex than any one President had under his immediate command. They wisely set up the machinery so that the faculties and staffs of the various institutions could cooperate. They did little to determine the ways such cooperation would take place. Since that time nearly 40 different projects have been undertaken. Most of these concerned themselves with the formation of Committees with the membership on these committees composed of counterparts at two or more CIC institutions. One thing that should be made clear is that it is not necessary to have all 11 institutions cooperate on any project. In fact most of the projects do not have this broad of representation. When two or more institutions do want to get together in the name of the CIC this is enough to work under the CIC aegis.

Two of the most active of the projects of the CIC are worth noting here. One is the exchange scholar program. Briefly this allows a graduate student at any institution to take courses at another institution without any of the usual problems of admission or even any problems of additional fees over and above those he would pay at his home institution. The visiting scholar is responsible for his own maintainence while on the host campus, but, other than this, he finds the way remarkably clear for him to partake of the particular and peculiar subject matter courses offered at the host institution. Several scores of visiting scholars are now active.

The CIC Liberal Arts Deans have been a particularly active group; and while they are considering a host of things, their most interesting experiment to date has been in the far eastern language institutes which are currently being held. These were funded by an outside source and have three years of support assured. The first meetings of the seminars were held at the University of Michigan this past summer. This next years seminar will be held at Indiana, and the third of the seminars will more than likely be held at Ohio State in the summer of '65. The best possible faculty was brought together for the seminar this past summer, and students found a stimulation in this sort of a joint seminar (which was attended by more than 100 individuals) than was possible had this sort of a meeting been held on any one member campus. (Centers for language areas are being proposed for each CIC campus - thus Slavic to Indiana, Purtugese to Wisconsin, Far East to Michigan, etc.) Apparently the Liberal Arts Deans are working on a sort of combination of the Far Eastern Language Institute, the language area centers and the visiting scholar program as it might apply to U.S.scholars visiting abroad. Thus there are thoughts that permanent staffs may be set up in a number of countries or areas of the world to which visiting scholars from any of the CIC institutions, and others on a contract basis, can report. These staffs will help the visiting scholars with their arrangements at the local institutions. Along this line, of course, there is a great deal of work that needs to be done with the host institutions to have them devise a curriculum for the visiting U.S. scholars that is meaningful.

The fore runner of the current CIC-ITV Committee was active about three years ago. At this time it was felt that there was a need for a rather massive outside support which would permit the development of truly definitive courses primarily at the undergraduate level in one of the sciences or basic humanities. A proposal was made to several foundations and federal agencies calling for something around a million dollars. This did not receive any support, and consequently the whole proposition was, in effect, abandoned.

The Presidents however were insistent that television was one area in which cooperation could be carried out. The president of Purdue, F.L.Hovde, was one of the most insistent of these, so it was only natural that I should take the lead in attempting to rally the people on the various CIC campuses who were responsible for instructional television there. I conducted a little informal, one page questionnaire and reported the findings of this questionnaire to the CIC. They suggested that we formally organize ourselves, and that we prepare to conduct an extensive survey as to what was going on at the various CIC campuses. This organization was completed last spring and the survey was conducted in the late spring and early summer. A book, a copy of which I have here, was then published and distributed in July of this year. This book lists some 106 courses or units that contain 1,961 lessons that are either being done live on CIC campuses or have been recorded and are being used currently. CIC-ITV Committee members have made good use of these books to inform counterparts on their home campuses of what others are doing at other CIC institutions. I'll pass the book around so that you can take a look at it. It more than likely is too detailed for general distribution. However, if some of you do have real use for an unbound copy I'll be happy to try to supply it. We plan now to up-date the book during the summer of 1964 and reissue it then in September of '64. Whether we will do this sort of up-dating annually will have to wait until we can see how many changes are actually made.

This book presents an interesting listing of what is going on. It is not, nor will it ever be, very actively used as a source of material which will be requested and used on other campuses. To the best of my knowledge only one exchange of material has actually come out of this book. This was the Psychology course between the University of Illinois and Purdue University. This was not wholly satisfactory even so because of the differences in organization between the Purdue and the Illinois courses. And it only served really to reinforce our belief that the key is joint planning, joint production and joint use. In other words, only materials that are specifically set up from the outset for exchange are going to find ready exchangeability.

We next set about to develop some general areas or categories that were best suited for cooperative production and exchange. These were submitted to the Liberal Arts Deans' Committee earlier this fall, to the CIC representatives, and to the CIC Presidents. This is "Report A".

Similarly, we prepared "Report B" and submitted this to the various groups mentioned above. This report showed the discipline categories arranged in priority order of their cooperative possibilities on the CIC campuses. I hasten to add that in this instance we are working with the Liberal Arts Deans, so, consequently, we are only interested in those subject matters or disciplines which at one or more institutions fall within the purview of the Liberal Arts Deans.

Now what has come out of all this, and what is apt to come out of it in the relatively near future?

1) We began thinking in terms of exchangeable materials so much that we now have a series of tapes available. They were prepared at Purdue and represent the best thinking in the highly technical area of Permafrost. These four technical papers were presented in an international conference on Permafrost were recorded and are now available for use by the other institutions as well as by Purdue within undergraduate or graduate classes where applicable. Indications are that four or five institutions will rent these from Purdue and use them in this manner.

2) We feel that with several groups, such as Geology and Education, there will be a gradual development of this joint planning, joint production, joint use idea. However, the development will indeed be slow. If we manage to do one of these a year we will be doing very very well.

3) We felt it was time, and have reported this to the CIC and to our CIC Presidents, that this is about as fast as things are going to go on a strictly cooperative basis. If they, or the CIC Liberal Arts Deans or any other one group, wish to take the lead, make the identification and point the finger at any discipline and say "Do it," then things will move faster. But it will only come if one of the major administrative divisions of the CIC institutions takes this sort of a lead.

4) We are convinced that there needs to be some standards set regarding production, tape recorders, visuals, films, etc. We are indeed glad the NAEB and the DAVI are now jointly planning an approach to some sort of standard on the new helical scan, tape recorders. This is, indeed, badly needed and should receive solid support from this conference if exchange is one of the things we really wish to promote.

In conclusion, I believe that the spurring on of this sort of cooperation will be the biggest contribution television can make to the total educational effort in the next decade. Certainly, we will enrich the curriculum of even the richest institution, and, certainly, we will break down some of the barriers that now exist between educational institutions and which cause expensive duplication and competition.

Cooperative efforts are stimulating, fascinating and frustrating. Frank Stanton, talking about another problem, put it something like this:

"Progress in such matters is determined more by the possible than by the ideal."

Much is possible by cooperation, but I am not certain that we know yet what is ideal.

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ITV PROGRAM RESOURCES AND UTILIZATION

National and Regional ITV Libraries

Edwin Cohen, Director National Instructional Television Library

The instructional television library project received its impetus from a 1961 U.S. Office of Education sponsored survey by Jack McBride and Wes Meirhenry, which really was an outgrowth of the general availability and application of the video tape recorder, which became generally available to education in 1959.

From 1959 on, in many parts of the country, material that had formerly gone into the schools live was now being recorded and retained, but it sat silently ticking like an unexploded bomb on a shelf of many radio stations and television stations throughout the country. This material, I guess, was viewed as a potential resource of great merit; and whenever you have a lot of material that might have value, I guess you ought to survey it. This is what happened.

It was found, I think to some people's surprise, that there were something like 15,000 individual lessons around the country, comprising about 500 separate courses, that were considered suitable for use in the schools. From this discovery and the generally expressed opinion that people in education would want to use materials from other places, there was created a demonstration project which was to test and to demonstrate the character and feasibility of a permanent library system to facilitate the exchange of this kind of recorded material. Three elements were to be tested and demonstrated. Two regional concepts, two regional libraries, and a national library.

What I am about to report on are the activities to date of the two regional and national libraries, and to indicate some significant factors that have appeared on the scene since the conception and institution of this demonstration a couple or three years ago, and to indicate where things stand at the present moment.

One of the three components was the Northeastern Instructional Television Library, which was contracted under Title VII of the NDEA to the Eastern Educational Network in Boston to analyze and demonstrate the policies, procedures, and practices necessary to effect regional exchange. Immediately that organization set up a group of task forces, involving at least nine-tenths of the adult population in New England, surveyed the regional curriculum needs and established production priorities for that region.

They gradually moved away from the library concept as being too static. They felt that the best thing that they could do was to focus on the needs for cooperative planning and production of actual broadcast materials for the schools. They have, in fact, after cooperatively planning with certain other training and evaluation aspects built in, produced a set of films that is presently being broadcast dealing with modern math for teachers, called "Sets and Systems."

The Great Plains Regional Instructional Television Library contracted to the University of Nebraska was to be a demonstration, as you all know, of the acquisition and distribution of ITV materials within and for the Great Plains region. It too began by surveying regional needs and acquired some courses. It used what I shall call a restaurant method of distribution, which is to say, that after acquiring the right to distribute certain courses, after having master tapes deposited with it (currently it has nine such courses available), it would accept an order from a potential user and then would prepare duplicate tapes on order. In addition to these nine courses, it serves as the regional outlet for certain courses that have been acquired by the National Instructional Television Library.

The National Instructional Television Library was contracted to the National Educational Television and Radio Center in New York City, and its mission, while somewhat similar to the other two libraries, was a demonstration to establish the practability and nature of a permanent national system. To do this, it too acquired and distributed courses on a demonstration base, using what I should term the cafeteria style. That is, it acquired the right to distribute and then duplicate, and set out on a steam table, these courses all ready to grab. When someone ordered them, he could merely take them home with him, or eat them on the spot, and then he would return them. The cafeteria idea now breaks down at this point, because we don't get the scraps back, we get the same thing that we put out.

We, also, at the national project faced a dilemma from the very beginning. The dilemma, I think, was whether we were a demonstration or whether we were a service. In terms of our contract, we were very clearly a demonstration. We could acquire a limited number of courses with which to experiment in order to find out problems involved in exchange. On the other hand, no one in the field would believe it. By that I mean, everybody wanted material of the highest quality and quantities of it. So when we hung out our sign, we were to be a cafeteria for all kinds of good material. When we only had four dishes, I think some people were disappointed.

At the very beginning we said that we would try and help others obtain directly from owners those materials which we, because of the restrictions of the demonstration, could not ourselves make available. So we threw together a master list of all the courses that all the owners in all parts of the country were willing to make available to anybody who might want them. This we called a "Guide to Available Materials." But that wasn't really enough, because you can't adequately describe what's in a telecourse presentation in words. So, since we needed it for our own evaluation purposes anyway, we went ahead and made a sample program from each of the courses this owner said he would make available to others. We created a cooperative, sampler library. A number of people have used this sampler library, and, by and large, the users say, "We think we could probably do better - that was pretty bad, wasn't it?"

This, in a sense, is to relive the history of educational television as it has evolved in ten years. I say this because I want to refer to it later.

I think that some significant external changes have come upon the scene since the basic thinking of 1960 and 1961. One of the new factors was the growing certainty that soon, and inevitably, there would occur the creation of the machine mileau and a great increase of distribution facilities whether we like it or not. New channels have been found and made available. New technology has made many places more anxious to go ahead, and it became possible for them to go ahead with ITV planning. Certainly, new money has become available, and, as in one midwestern state, the legislature considered making an application for this money on the grounds that if we don't get it now, we may never get it. Money is hard to turn down. So I say that inevitably there will be a substantial growth in the number of television facilities in this country whether or not we are ready for it.

The second factor was not apparent in 1961 because of the vagaries of Congress. This factor was the retirement from the fray of such major forces as the Ford Foundation, and the National Educational Television and Radio Center. They both, dramatically, suddenly and recently announced that they were in a sense retiring from the instructional television field. In general, you might see in this action the rationale that since the youngster has been force-fed for 10 years it certainly ought to be able to go on its own steam from here on out. At any rate, this is the situation.

The third factor, to come upon the scene is an outgrowth of these other two. In September of this year an attempt was made to pull together a single person or persons from each of the various states who was responsible for the planning or development or application of television in education in those states. Forty-three such states and the District of Columbia were represented. The consensus of all these people in all these states concerned was that there is a materials crisis on the horizon, and that there is an urgent need that "quality" instructional television materials be available from other sources to supplement local instructional television materials.

If you will excuse an imperfect analogy again, you might say that the boys are out dropping coils of garden hose in every state in every community that represents the distribution system. In some places there is real concern as to what the hose is to be hooked into; what's going to go through the garden hose. It could be cold water, and it wouldn't make a whole lot of difference. It could be rackish water and it will kill, or at least it will create or leave a stench. Or, it could be liquid fertilizer, which has a stench, but at least it results in something good.

We have been hearing about the wonderful technology at our disposal. Everybody has been saying, in a sense, let the other fellow worry about the proper application of it. That is, the equipment people would be the first to say, "We don't have anything to do with the programming, like the people who made the atom bomb. The educational broadcasters frequently retreat and take the position, "Well, we're just providing, we're operating a service. Just tell us what you want on the air, and we'll do that for you." But I haven't heard in all this vast land of ours a great rushing sound of educators coming forward to say, "We'll create the material, we know what we want, and we'll do the job. We'll do the job to make television do what it ought to do."

I say this because we in the library project have reacted to these various forces by believing that we no longer have time to conduct to its normal end, which would be 1965, a demonstration project concerned solely with running a pilot for what ought to be. We think the time has, in a sense, run out, and we are accelerating the end of what might be characterized as the demonstration center service phase.

We are currently working on the design of a service-centered demonstration to begin in June of 1964. What are we thinking about? Well, we couldn't duck it, so we've had to tackle it. We're thinking about the definition of quality instructional television material? We're thinking about the extent to which existing recorded material can satisfy quality. We're thinking about just how an adequate supply of quality materials can be assured for those who wish to use them. In this connection, we're thinking about the alternatives and possibilities in procurement processes, the organizational requirements and the financial support that is necessary to make all this happen. I would say at this moment that we are persuaded on the basis of the activities in which we have engaged, and we've spent $900,000, or have that much committed, that we don't know enough from the evidence that we have gathered to be pessimistic nor optimistic. But we do know enough to be mightily concerned. At the present moment, we're just plain busy with these concerns.

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THE NEW MEDIA IN EDUCATION

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Most of what I'd like to say reflects an optimistic view of the roles played by new media in education and a personal sense of enthusiasm regarding the future. First, therefore, I should express reservations I do feel regarding our present situation.

American education hasn't yet, and isn't very likely in the future, to be completely overhauled, restructured, supercharged, accelerated and/or rendered totally efficient simply by using television or through the application of any other new media. Neither teachers nor educational institutions will change very much or rapidly away from instructional conservatism simply because they may have purchased with government money video tape and teaching machines. Although we've had the motion picture for nearly a half century, excepting the case of a few very recent experiments, it doesn't appear that we've ever really tried to apply what we've learned in producing modern teaching films. And in spite of its ubiquity for more than a quarter century, it was only this year that radio regained a place in the educational "sunlight." One-fifth of American youngsters are, indeed, probably being taught by television during some part of the school year but by no means half as imaginatively as indeed several hundred studies and experiments have shown they can and should be.

So the first point I'd like to make is this - Thanks to foundation and Federal dollars and fantastic amounts of energy expended by our professional colleagues, the new media are *in* American education today, but they aren't really *of* it in the sense of full acceptance, integration and sound employment in terms of optimum teaching and learning efforts. We don't yet have the trained teachers and media specialists nor the organization of school and college curricula most conducive to optimum use of all new media. And so - to end this statement of reservations, what I have to say is best expressed in the future tense and will concern what I believe the new media can or will contribute to help meet the problems of education.

In short, excepting specific projects mentioned, we shall from here on be chiefly concerned with the promise of the new media rather than with a harvesting.

In the context of instructional promise the new media do look very good. In referring to the new media we are thinking of television and video tapes, the motion picture, the listening or language laboratory unit, teaching machines and programmed instruction, overlay transparencies, multi-media approaches and the new simulation devices. Experiments completed during recent years suggest that application of these media isn't limited in any way to given levels of education, to given types of subject matter, nor to independent functions.

Indeed, the research evidence says overwhelmingly, "When they are used appropriately, the new media can be major factors in bringing about change and improvement in education." For instance, as I've had the chance to report on several previous occasions, new media research and experimentation have taught us again and again that school and college instruction isn't always most effective when conducted in "little square boxes" of 20 to 30 feet on a side. We've also learned from new media research that people having different backgrounds can often learn quite different things, at different rates, and that some can learn better from one type of material while others may need very different helps.

We've also learned from new media research and experimentation completed during recent years that there isn't any magic in a nine-month school year or in a 40 to 50 or 55 minute class period. We've learned that sometimes people become more interested in what they're studying and that they can remember much more of it afterward if they can work alone, have a brief period for review shortly after initial study (and then receive only occasional guidance by talking informally with faculty); that others may learn very well indeed from the "give and take" of class discussion; that parental aid in learning languages taught by television is capable of producing excellent results; and that some ideas are mastered easily by very large groups of several hundred or more students. We've also learned that unless our educational facilities are made sufficiently flexible to provide the kind of instruction required for use of new media, they probably won't be worth the very large and, indeed, the increasingly vast amounts of money they now cost.

With regard to the media themselves, we've learned that today we must have immediately at hand the full spectrum of learning and information resources including books, magazines, and other forms of printed materials; pictorial and graphic aids, motion pictures, discs and recordings; television and teaching machines - we need them all for instruction as well as reference purposes, and sometimes we need many of them at one time - at other times, only a few or single units. Especially with respect to materials used directly in teaching, we've learned to look among all available media and seek out those which will help most directly to achieve a given goal of instruction, individual study or review, as well as in classroom presentation.

And here now are some additional facts concerning research completed in the field and experiments of more recent years with which I've had personal acquaintance and a number which are summarized in an excellent volume edited by Brown and Thorton on The New Media in Higher Education. You know that television can, and is being used, successfully in teaching the full range of academic subject matter. The assist it can give to education through permitting the sharing of resources has been demonstrated in many parts of the United States and specifically studied in Oregon by the higher education system as well as in T.E.M.P.S., the Texas Educational Microwave Project. Closed circuit TV has indicated high potential for improving instruction in surgery, dentistry, medicine, psychology, etc., not to mention reading, languages and math and the physical and natural sciences. More specialized applications of CCTV include, for example, teacher and classroom observation as a part of a teacher training program, use as a simplified aid to one-way vision in training guidance counselors, presentation of review material and of standardized exams, and even transmission of research documents from a central to a branch library. Indeed, experimentation with television and, especially with closed-circuit systems, has created a situation in which it appears the medium may well become a 24-hour carrier of everything from formal classroom presentation to enrollment figures and statistics of local stock inventories and has shown that the design and development of TV service in American schools and colleges will increasingly be conceived as an instructional service program linked directly to data processing, library and audio-visual service agencies rather than in the previous image of a separate TV station.

On the other hand, broadcast TV must continue reaching out to where people are with non-credit as well as credit instruction in adult and continuing education. It must also continue the work of trying to bridge educational gaps - for example as between high school and college, and in filling instructional vacuums, for instance that currently represented in the national requirement for manpower retraining and related problems of relocation. And this additional comment concerning research on educational uses of TV - from my point of view, we've reached the stage when studies should no longer be supported to prove that television can teach this or that to large and small groups of individuals. The questions we now should ask about TV are different ones and very much harder: Where does television fit best in the school or college curriculum? How can its utilization be improved and how can its management be helped to be more efficient and economical?

Programmed instructional approaches are in fact accelerating rates of learning as well as individualizing study today in thousands of American homes, schools and colleges. Programmed instruction has proved effective in a broad range of subject matter areas including statistics, Russian, music, chemistry, biology, religion and the humanities, remedial English, and engineering. TV combined with programmed instructional approaches has also been studied at Penn State and is now being researched at UCLA. Computer control of programmed learning is the central idea of the PLATO system at Illinois, and has also been used experimentally by the Systems Development Corporation in California not only to make available the full range of modern techniques for storage, retrieval and correlation of data masses, but also for instructional sequencing and the simultaneous recording of student responses to virtually any form or combination of forms of instructional media presentations.

To comment further on programmed instruction, I'd like to say the development and application of programmed learning in elementary and secondary schools doesn't, in my opinion, represent the invention and use for instruction of what is a totally new medium of communication. Rather, I tend to define programmed instruction as a small step-by-small-step approach to the organization of learning experience - an approach which is keyed to some rather explicit principals of stimulus response psychology which were discovered quite a while ago and tested in the initial stages with pigeons and rats in university laboratories.

Also regarding programmed instruction, the most essential concepts which underlie the arts and sciences of programming are now making contributions in team teaching, to ungraded programs, in dual progress activities and the like. Programming methods have also been tried in other areas of school work, for instance in the laboratory, in homework, group discussions and seminars, for investigation, for self-correction, writing and so on. But from my point of view, within a few years programmed learning approaches will probably be judged more significant for their encouragement of improved educational engineering and as almost unequaled sources of feedback from the learning process with specific contributions made to production of better textbooks, instructional television, motion pictures and lessons plans, etc. than they will for uniqueness in form (i.e. programs themselves) or their contributions through teaching machines. Incidentally, and conversely, I'd like to suggest that some of the skills of good text writing - demonstrations and visual communication - have much to contribute to programmed learning.

The single laboratory unit has virtually become standard equipment for teaching languages and, increasingly, other subjects including shorthand, music, drama and speech etc. The library of audio tapes available for use in the listening laboratory has already become in some schools and colleges quite formidable in size. The chief policy question now arising is how long should the tapes actually be kept, for what purposes, etc.

Of course, the learning laboratory station (or carrel) isn't really a medium. It's simply a place or environment designed especially for listening, viewing, etc. which may cluster a variety of media - an environment, incidentally, which according to studies now under way (and one of these is at the University of Pittsburgh) may be influenced more significantly and effectively by its actual size, its capacity to isolate students one from the other, design of its control panel and so on, than by what it can actually communicate through tapes, films, slides and other materials.

Also at Pitt is another project which highlights the promise of the large overlay transparency as this medium is used by Edwin L. Peterson in offering a new approach to the teaching of English composition and style. Using his overlay techniques Mr. Peterson almost appears to make even commas as well as colons become interesting as they flash on and off the screen in colors. And, to suggest a more subtle but perhaps more important value, he has enjoyed remarkable success in teaching awareness of language organization and style, etc. using visual techniques which in themselves highlight and reinforce reading in a manner calculated to stress the points which are being taught. The Pitt project is labeled "Luminous English", and I think it's a very appropriate name.

We could also talk about engineering, dentistry and physics, or a thousand other applications in the elementary and secondary school or college classroom of this valuable teaching tool, a tool which can be animated by changing the polarization of light as it projects on the screen the transparent image and thus creates the illusion of motion, e.g. the human bloodstream or the flow of winds in a high pressure system if the subject were meteorology.

Work being done in Monmouth, Oregon has suggested some new and exciting approaches to the problem of teacher education using simulation devices. These are devices, not unlike the driver-trainer, which place students in artificial environments and present some specific situations to which a student must respond by choosing among alternatives and actually carrying out a particular course of action. Such systems can make very extensive use of slides, films, graphic materials and recording equipment as well as supplementary printed aids, and they are usually programmed in a very specific sequence which, however, allows for branching and a selection among alternatives.

Use of new split screen techniques for making comparisons in teaching has been pioneered by various units in the armed forces. And since 1961, the University of Wisconsin has featured this technique in its multi-media instructional lab. In my view, experiments such as these are most significant in the sense that perhaps they foster learning processes as a result of achieving a new perceptual synthesis. For instance, one might show at the same time in fixed positions several elements and time phases of a demonstration on crystal formation while utilizing the motion picture to show ways in which a crystal changes and final results of a laboratory experiment.

We haven't said very much concerning the motion picture other than to note the fact that our production techniques are usually something less than startling. But, it may be, that during the last few years we've finally learned to stop making instructional films in the image of textbook chapters or sections and to use film more imaginatively - whether we're actually concerned with illustrating dynamic concepts involving motion or inducing appreciation of a dramatic sequence, with creating a mood, or hope to present vicariously with proper editing of space and time, elements in a scientific process.

In any event, we do seem to have learned in very recent years to use the film with individuals as well as groups. We are also beginning to see the promise of film in short clips when used to portray actions which a student must later verbalize and dramatize in a foreign language, its worth as a research tool and/or a record of research. Thanks to 8 mm. cartridge-loading film projector we now have the single concept film and probably even more important - the quite remarkable experiments of Lou Forsdale at Teachers College, Columbia University in developing 8 mm. film which, when used with a British rear screen version of the little technicolor projector, calls up direct viewer response in tracing numbers and figures on the screen as a film clip teaches a diversity of subjects ranging from the brush strokes of Chinese caligraphy (which apparently can only be performed in a specific way because of the nature of the instrument used in performing the art) to something approaching flash card techniques for learning simple multiplication. The film is also being used in such fashion that the child almost literally plays a game by pointing at the part of the word which separates when hyphenated--to mention a very simple example. Whether Louis Forsdale is right in claiming that 8 mm. film is the most important teaching tool of tomorrow because it can now be made available in a form which even small children can use without hurting either materials or machines, remains to be seen. But the related point he makes is even more significant, and that is that we haven't really begun to think of the medium in other than very standard ways, and its promise for use in formal instruction is, therefore, as yet almost literally unknown.

Well, perhaps I've covered enough examples to suggest to you some of the ways in which new media help to improve and enrich both teaching and learning. But before moving on there are two additional points I'd like to make regarding current media projects and research. It is true that we do now have available for use in education a very rich variety of improved and newer media capable of single and multiple use. But when we consider their instructional value, I believe it may be most important to us - for instance in the case of television - to recognize that because of its expensive technology and its nature as a carrier, it has been introduced too frequently in schools from the "top down" as a result of administrative fiat. An unfortunate consequence of this could be that the content of American education might be determined more by persons concerned with the technology and the mass dissemination of messages and less by professional personnel who are truly knowledgeable of and concerned about the instructional needs of youngsters in school.

My other point concerns the kind of research we've been doing. Researchers themselves admit generally that too much media research suffers from the lack of reference points in theory and a serious lack of precision in specifying criteria which should be used for measurement. And, in my judgment, the key problems which now must be solved in planning optimum use of E and ITV, as in the case of other new media, aren't very likely to be resolved by mere expensive support of several hundred discreet studies of the kind typical of those completed during recent years. The research we need most in ETV must be of a kind developed more in sociological and organizational terms and which will relate more to educational practices than to the psychological laboratory. To use a simple analogy in the same way that studies of aerodynamics and carburetion have little or no direct relation to the influence of jet age transportation on the world's business and industry (although, in a sense, one clearly is cause and the other effect), so I doubt whether more discreet studies of learning behavior induced by TV will give us the answers we need so urgently for planning service in our schools or for designing plans for TV administration.

And, on reflection, there's still another point I'd like to make concerning new media research and experimentation and its implications for the future. We need to be less parochial and give more attention to work abroad. Although most new media programs established in Asian countries are restricted to higher administrative levels and don't have much opportunity to influence local education, there is considerable likelihood that many Asian countries will have instructional television long before they have developed for schools any very successful programs for films, slides, and film strips.

By contrast, in Japan which is, of course, the exception and has a very advanced media program, the use of broadcast television is far and away superior to much that I've seen in this country. The same can, in a way, be said about limited aspects of Italian TV and the potential which is represented in French instructional television, also a nationalized endeavor. The importance of teaching films in Germany and of the co-production plans and projects common throughout western Europe may be well known to most in this group. But are you aware that in the realm of programmed instruction, the French and British are coming along, the Japanese are moving rapidly and if recent statements can be believed (and I'm quoting a recent confidential report on the subject) the Russians "have achieved greater development in this field than the rest of the world, including west Europe and the federal republic of Germany (excepting the United States.) The importance of this development cannot be underrated since the Soviet Union endeavors to continue experimenting in this field in order to'catch up with and surpass the USA'". Or at least so says Mr. Hartmut Vogt in a recent statement on cybernetics and Soviet pedagogy.

Now in the time that remains I'd like to list a few obstacles which stand in the way of our making the most effective use of new media in American education. And then, since we can't solve all our problems at once, I'd like to give special attention to two of these problems - that concerning personnel needs and the other, new media service organization and management.

During recent years several surveys have been conducted to find the barriers to effective use of new media in education including studies of teacher and pupil resistance and other psychological factors. The results of such surveys and, indeed, the consensus reflected by most teachers and educational administrators suggests that, while psychological factors are present, the chief obstacles which lie in the path of new media utilization may be more obvious. Too often teaching materials and equipment aren't available when needed. Many classrooms aren't equipped for projection of films and other visual materials. New media service programs and systems serving both schools and colleges aren't sufficiently well organized to guarantee that a teacher can have the right material in the right place at the right time. Budgets are still very far below standard, and there exists an almost desperate shortage of appropriate materials in many subject matter fields.

Further, while the new Educational Media Index scheduled for publication next spring by the McGraw-Hill Book Company may overcome a part of the problem, there does exist over the country an acute lack of information concerning materials and services which can be obtained.

From my point of view, there are two additional obstacles to effective use of new media which are even more significant: First is the lack of teachers, school administrators and media service personnel trained properly for optimum utilization of television, programmed instruction, etc. The second derives from our urgent need for new administrative arrangements conceived on a regional basis for providing new media service to schools. Then too, we lack a clear philosophy which knits the fields of media service closely enough together to overcome the lack of sound media management patterns which are still to be found in a majority of schools and colleges. Keys to the new philosophy needed may be found in programs now being established at the University of Miami in Coral Gables; Stephens College, Columbia, Missouri; George Peabody College in Atlanta, Georgia; and in particular at the new Division of Learning Resources at Florida Atlantic University. This new division has been justified as an agency having two functions: (1) To put at the disposal of a teaching faculty all media technology, service and systems which will enhance the effective communication of ideas in a pre-programmed phase of learning; and (2) to put at the disposal of the student all media technology, services and systems which will enhance the effective communication of ideas in a self-programmed phase of learning. Given objectives such as these and development of the professional education programs needed to recruit and train personnel able to appreciate and carry out such objectives, we may begin to fill this void.

Now, for whatever it may be worth, here is my view of how I think we should go about it. First, we need a new definition (possibly for some a redefinition) of the fields of media service responsibility. It's my opinion that a cluster of six functions can be said to represent the chief media service requirements of American schools and colleges and that, increasingly, these functions must be performed under single professional management. These six functions include the following: (1) Continuing research and experimentation involving both instructional uses of media as well as the study of media service arrangements essential to satisfy the needs; (2) local adaptation of teaching materials as well as production of new learning resources, taking into account any special requirements which specific media may have as well as the need for "conceptual interlock" which increasingly must guide preparation of new materials in terms of their anticipated use in teaching; (3) distribution of all types of materials and equipment essential to aid the instructional research work of groups and individuals within the school or college community; (4) counseling and training of individual teachers, students and student groups to identify their requirements and for improvement of media use; (5) demonstration and display services which will be more adequate than those normally provided in schools operating under typical present-day arrangements (arrangements which so frequently tend to place responsibility for such work in the office of a harried superintendent, principal, or university functionary); (6) full use of modern computer technology which can be employed not only to solve problems of an advanced statistical nature and undertake information storage and retrieval work, but also to generate new instructional programs and, by what amounts to massive data correlation, and actually through synthesis create new knowledge by "intellectronic" processes.

The second recommendation I'd like to offer concerns recruiting and professional education as such. In my view, ETV personnel, programmed learning specialists, librarians and audio-visual coordinators are but single groups of specialists concerned with educational communication and information services. This then should be their new "umbrella". Here is one of the reasons why. Regardless of specific media interests and basic undergraduate preparation, all media service personnel working in educational fields must have thorough training in education. Those who look beyond initial professional specialization toward eventual acceptance of a top management post, for example as supervisor in a school, school system, county or state agency, there must be represented in the professional curricula basic study of learning and information theory; communications theory, institutions and processes; systems development and engineering; a mastery of administrative science; a thorough grounding in economics, research methods and statistical procedures; full understanding of media production arts, crafts and sciences; as well as capacity to appraise the methods and techniques of instruction.

Further, (at the other end of the media service career ladder) we must develop new and specialized programs at the junior college or lower division level which will lead to preparation of educational technologists. Also needed urgently are more opportunities for in-service training of practitioners and provision of retraining opportunities for managerial personnel.

In short, we need consciously to recruit and breed the new hybrid who will manage our educational media programs of the future. Fortunately for all of us, two studies are currently under way - one at Alameda County College under the direction of Bob Hall, and the other (I am pleased to say) at Pitt. Both presently appear to look toward development of an inter-divisional program in educational communication and the information service professions which is likely to have several internal paths of curricula, but which, calling upon resources available from the total University, is conceived in terms of media service findings as we defined them earlier, i.e. research, planning and project work; production; distribution; advisory and training services; demonstration and display; and the harnessing of computer technology.

And here's the last point I'd like to develop formally before giving an illustrated report on an ITV project completed recently at Pitt. It's my view that over time (and it probably won't be long at that) we'll see develop on a regional basis- crossing municipal, county and state lines - new instructional media service programs created for the purpose of serving both public and private education. These new programs will give special attention to production of teaching materials (especially production of instructional TV and related supplementary aids); provision of research and evaluation services; in-service training of teachers for optimum use of learning resources in general ; and the regular exchange and distribution of instructional materials and equipment required for use of all new media; the authority for and support of such regional efforts will have to be obtained through delegation by those who will benefit most directly from whatever services are provided, probably employing a regional council or federation plan. Such instructional media service "reservoirs" will, as I see it, enlarge logically and greatly extend the reach of the educational media service program. In any case, they will provide new and very much needed larger units of service which may perhaps, thanks to national efforts now being considered, evolve logically into a media service complex approach - a complex capable of being tied (as I think it must eventually become) directly into a nationwide system of educational intercommunication and information services. A massive program of state and Federal aid will, of course, have to be developed to support such an effort, and it must be one which extends very far beyond the present provisions of any legislation in being, or that planned, if we are to reach the goals described.

Nonetheless, such is the need and now here's an ITV illustration of the point in a western Pennsylvania dress.

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WHAT ARE THE DEVELOPING PATTERNS IN THE USE OF TV IN EDUCATION?

Educational television has its own nomenclature and its own "alphabet soup." To the uninitiated, the terms are new and often difficult to comprehend. The alphabet language further complicates an effort to understand educational use of the medium.

The umbrella term is ETV, or Educational Television. The term denotes a television station operating on a not-for-profit basis over a channel reserved for educational use, but it connotes the full range of television programming designed to instruct and inform as against that designed purely to entertain.

More often than not, the term ETV carries a heavy implication of broadcasting; that is, the pictures are thrown out over the terrain for anyone to view who has the set capable of receiving the signals. In contrast to this system, in closed circuit television - CCTV - the communication is private and is directed to specific receivers where, it is expected, particular people may be expecting to watch. CCTV simply describes the method. The signals travel on a cable, or via micro-wave, which limits reception to specific receiving situations. The messages carried may be educational or not, commercial or non-commercial, for that matter.

Then comes ITV, Instructional Television. This umbrella is smaller than ETV, for it connotes programs or communication designed specifically to instruct. The suggestion is a somewhat more formal idea than ETV, because ITV is more closely related to subject matter carefully organized, presented in sequence, filling out an entire course of study or simply supplementing the teacher's efforts. The boundaries are hazy between these terms, because ITV may be transmitted via closed circuit or on a broadcast basis. When ITV is broadcast, it is also ETV. ETV has a broader connotation encompassing the broadcast general education presentation in addition to that which is formally instructional.

The entire field of formal education, from pre-school to post-graduate seminars is open to the application of the television instrument. The instrument has its applications as well in the informal education of a nation stretching over the range from the toddler to the tottering.

One more alphabet item for the educational administrator and policy maker to tuck into his lexicon for television is VTR, video tape recorder. This is the device which can store television program materials for later use, and the dimension it has added to the potentials for educational television are as yet beyond measurement.

Closed circuit television in education is growing rapidly with uncounted installations, from the simple to the elaborate, serving also uncounted numbers. Because it travels its signals via coaxial cable or micro-wave, closed circuit television has no problem of space in the spectrum. The limitations of its equipment determine the number of channels it may employ.

Many varieties of closed-circuit systems are in operation ranging from one link between camera and receiver in the same room to 167 interconnected high schools and 14 higher educational institutions scattered over the State of South Carolina. They are being used to stretch teaching space, to supplement the teacher supply, to combine and teach large classes, to link widely separated classrooms, to observe teaching and learning, to supplement the day's lessons, to carry the entire day's teaching presentation, not least of all to improve instruction, and finally to effect economies in the educational process.

Many of these same ends are also being achieved through broadcast television today. There is every reason to believe that rapid growth will occur in the years immediately ahead in the licensing, construction and operation of educational television stations.

Educational television on a broadcast basis is subject to license, simply because the physics of the matter require that assignments be made to operate on separate and distinct channels in order that one operator may not interfere with another. Each such channel has a commercial potential, hence, through the persistence of a few farsighted educators and the courage and foresight of a few government officials, the prospect of holding some television channels for educational use was achieved in earlier years and has been maintained in more recent years.

Today the Federal Communications Commission, in whose jurisdiction all licensing power falls, is proposing a still further reservation of television channels in the UHF ranges for educational purposes. Currently there are about 350 reserved channels. The FCC proposes to raise the total to 703, and this proposal is being debated with the National Association of Educational Broadcasters who think that a plan reserving 1,000 channels for education is a still better plan.

In general, the FCC has sought to locate a reserved educational channel in every community in which educational interests have indicated a need and two in communities where more than one has been requested.

One close observer of the rapidly developing application of television to educational tasks, estimates that the currently licensed and operating 83 ETV stations will increase to a total of 300 by 1966.

As the numbers grow, so grows the opportunity and feasibility of interconnecting groups of them into networks through which educational communication can be shared. State-wide networks are now in being, as are networks in contiguous states interconnected to allow live television over the entire course of the net. Other networks enjoy an interrelationship which doesn't include the live program capability but which is based on the provision and exchange of programming via recordings.

In the network concept lies one of the answers to the building up of a reservoir of educational materials of quality with numerous production centers producing for other than their own use and sharing the productions of other producing operations.

The greatest stimulant to production of educational television materials has been the National Educational Television and Radio Center. Recent policy changes in this organization, which call for its attention to be concentrated upon high quality programming for educational purposes, promise to make state and regional networking even more important in educational television.

The foundations have been laid, though the superstructure is slow in rising, for the creation of a nation-wide interconnecting of educational television stations with a live program capability. Knowledgeable educators see in this one of the nation's most important educational and cultural assets.

Still another pattern for the broad dissemination of educational communication has been under extensive testing and the experience is showing interesting potential. It is the Midwest Program on Airborne Television Instruction (MPATI) through which instructional television is broadcast from high flying aircraft to schools in a six-state region.

MPATI attacks the problems of programming and disseminating educational communication by adding new dimensions to the technology, in programming and in the economics of educational television. The program covers a six-state universe of potential school consumers of widely differing quality. It ties in several production centers through cooperating colleges and universities, and it substitutes a broadcasting station - or several of them - at an altitude of 23,000 feet in lieu of many ground-based stations. Even now MPATI seeks four additional channels to enable the program to expand vertically into collegiate realms and horizontally into a wider range of subject matter at the several grade levels it now seeks to serve.

One thoughtful educator, experienced in educational and instructional television, has observed that the capacities of television to serve education are limited only by money and imagination. The patterns which are emerging strongly suggest that the insatiable appetite of television and the constant drive for improved quality in educational communication via television have established the trend toward combinations of station facilities and talents which may logically cooperate and enhance each other's educational fare.

Mention must be made again, however, of the promise which the recording, storage and reproduction of quality educational television materials holds for the school, the school system, the college, the university and the extension center. Libraries for such materials are in the experimental stages now. They suffer mainly from a paucity of customers and of quality material neither of which can be far away. Under various sponsorships, and with support from the Title VII program of the National

Defense Education Act administered by the U. S. Office of Education, three such libraries are now operating. They are the National Instructional Television Library in New York, the Northeast Instructional Television Library in Cambridge, Massachusetts, and the Great Plains Library at the University of Nebraska in Lincoln.

STATUS REPORT: EXISTING AND PENDING ETV FACILITIES

Lawrence T. Frymire, Chief

Educational Broadcasting Branch

Federal Communications Commission

I'm not sure, as close as we all are to the elements of educational broadcasting, that we are completely aware of the magnitude or the dimensions of educational broadcasting today and what people are saying about it for the immediate future.

I would like to highlight briefly the recent past and take a very casual, but quick, look at the immediate future from the vantage point of the Federal Communications Commission and its role in fostering the development of educational broadcasting. It is obvious to everyone that educational broadcasting did reach new heights of development during 1963. The first ETV station to go on the air, KUHT, at the University of Houston, celebrated its tenth anniversary. The eighty-third station went on the air in Greenville, South Carolina, the first of several broadcast stations proposed in that state. These 83 stations are serving a potential 110 million Americans in some 37 states. In the Commission, we now count 26 outstanding construction permits for new stations. There are some 37 construction permits pending.

We have petitions asking for the reservation of some 82 channels in addition to 350 that are now reserved. There are approximately 500, or you name the figure, closed circuit TV installations serving educational, military, and hospital facilities at the present time, and more coming into the service almost too swiftly to keep track. There are some 5,000 people directly employed in educational broadcasting and/or closed circuit facilities. Approximately another 10,000 are related to educational broadcasting or these facilities by virtue of their involvements as teachers, participants, or educators professionally interested in the use of broadcasting and/or closed circuit use of the medium in the teaching/learning process.

The capital investment in broadcast facilities is now over $40,000,000. The operating costs for 83 ETV stations alone approximates $20,000,000 annually. The Educational Televisoon Facilities program under Public Law 87447 made its first group of five grants to ETV developers in South Carolina, Illinois, Utah, Virginia recently. Five other grants will be announced shortly. The expenditure of these ten grants will involve approximately $2,000,000.

The Commission issued a new proposed table of allocations for television, which suggests the reservation of 703 channels for ETV, including the 100 plus VHF channels already reserved. The new table also proposes designating some 44 cities in the major population areas for two ETV channels. This means there will be some 703 ETV channels reserved for education. Our general objective has been to provide at least one educational reservation in every community where educational interests have indicated a channel is needed and two channels in places where more than one channel has been requested. We have used specific state plans where such plans have been submitted. In other states we have used the information contained in the NAEB National Survey of Educational Channel needs. We have also attempted to provide at least one unreserved assignment in every community with a population of 10,000 or more, except for communities which are near larger population centers.

In any case, the objectives of this proposed plan are already met by existing VHF channel assignments. Where the objectives are only partially met by existing VHF assignments we have attempted to add UHF channels. Wherever there was a choice between a community slated for an educational reservation and having none and a community slated for a commercial or unreserved assignment, preference was given to the educational need first. I should point out that no effort was made to saturate 70 UHF channels. If assignments could not be made in accordance with the established guide lines, no assignment was made. A number of assignments on the table currently in force have been deleted and omitted from the proposed new table, because they did not meet the established criteria. However, none of these deletions affected construction permits, petitions for channels, or existing stations. The omission of these assignments does not preclude future assignment in these communities if the need arises. However, in some cases, the omitted assignments have been, or may be used, to meet the demand in other places. I also wish to reiterate that the naming of a particular community on this table does not mean that the specific city is more deserving than a city immediately adjacent. It merely serves as a reference point to the area in which the assignment may be used. Usually this refers to a 15 mile radius of the assigned location. If a community is not listed in the proposed table, it does not mean that it will not have a channel available for educational development. Recall, if you will, that educators have acquired some 110 channels in addition to the 242 originally reserved.

It is assumed that we will continue to make channels available to any bona fide user through our normal petition process. What I'm saying is that 703 proposed reserved channels is not a fixed or final figure. While not meeting the NAEB proposal of nearly 1000 channels needed for education, we have moved in a substantial manner to continue to offer educators the opportunity to add channels to the reserved list in the future. You probably have recognized by this move and other supporting actions of the educational television development in the past, and we hope in the long term picture, that the attitude of the Commission is one of sympathy and keen concern for the development of educational broadcasting.

I think it's obvious that a pattern of individual station support is becoming more evident. We know there is an increase in dependency for support of educational television upon school systems and other public education funds. Coupled with this is the fact that more and more applications from stations are coming from public educational groups, fewer from community leaders. This indicates that in the years ahead school men will be in direct control of the stations, or because of their substantial support of the stations will in effect be in a position to call the shots on the programming and operation of these stations. While the Commission, I feel, should not hesitate to authorize ETV station licenses to such individuals and groups, at the same time we should make clear our interpretation of the need for ETV stations to serve the broad, cultural and public service needs of the people, and not be limited solely to in-school educational programming, as important as this programming is to the American educational establishment.

To insist upon the expanded use of the television medium, the Commission adopted rules and regulations instituting a new low power, instructional television, fixed service in the 2500 megacycle band, which will enable educators to make use of television techniques without resorting to main channel broadcasting. I'm sure that most of you in this room are completely aware of the potentials of this service. I might just point out very briefly, this offers educators the opportunity for multi-channel use for distributing educational material on a local basis. The system is not intended to be hooked up as a state-wide distributing service, but it certainly does have the facility to expand into coverage of regional areas within a state. The Commission adopted rules and regulations instituting this low power, instructional, fixed service, and the form is available. We have not yet accepted our first application. I would be regarded as an over-optimistic enthusiast if we don't get some 50 applications by the end of this school year, but I expect that we will. I'm still optimistic.

The Commission continues to support the development of educational radio by authorizing new stations at the rate of better than one per month during 1963. Currently we count a total of 261 operating stations. Of this total, some 228 are FM stations on reserved channels. There are 18 FM educational stations operating on unreserved channels. Of course, we have a steady figure of 25 AM stations operating non-commercially by educational institutions. I think one of the most dramatic proposals for the future development of educational radio lies in the possibility of establishing, on a step-by-step basis, a nation-wide educational system. This is an idea that has grown out of the extremely successful, but now ill-fated, Educational Radio Network in the eastern part of the country. Plans set forth by leaders of that network, plans under discussion for a number of years in the Midwest, plus some enthusiasm shown by the Committee on Institutional Cooperation of the Big Ten Universities plus the University of Chicago encourage more planning for the use of educational radio. Very shortly, we hope the CIC will launch a pilot project to show the feasibility and the possibility of extending radio's uses across the spectrum of educational needs. The NAEB will be conducting a seminar on the future of educational radio late in January here in Chicago. Again, we hope that we will see a dynamic development occur in a short period of time that will again prove the validity of the use of educational radio to meet some of the challenges confronting education today.

We have also noted an increase in the use of ETV in many areas of in-service training of adults. One of the more important developments related to adult education and in-service training is the programming offered by what I've chosen to call the new "breed" - those TV stations licensed to municipal governments. So far there is only one. In 1962 the Commission authorized the city of New York to operate a TV station as a non-commercial service on Channel 31. The city immediately embarked on a schedule of programs specifically designed for reaching city employees both while on the job and at home. An example of the effectiveness of this type of adult education station is the experience of the training officer of the New York City Fire Department who has been able to reach, simultaneously, all 15,000 members of the Fire Department in the 280 fire houses. The fire houses are equipped with television receivers to enable the employees to take part in on-the-job training via a series of television programs. Prior to this development the training officer needed a whole year to go from fire house to fire house presenting his particular subject in a regular training period. Today, a half-hour program repeated twice accomplishes virtually the same objectives in a more efficient and highly effective manner. I am sure that the city has been most successful in presenting valuable information to its employees in other fields, such as the areas of general welfare, public health, crime prevention, etc. I believe this indicates the probability of other large municipalities seeking television channels for similar use in other parts of the country. I would assume that the educational body of the United States would be in the forefront in proposing the further development of such services.

Some 40 states now have official ETV commissions, authorities, or councils, organized to assist in planning for the orderly development of ETV within their respective states. Some 27 states have submitted to the commission full-blown plans for state-wide development of ETV. Others are being developed but have not yet been submitted to us. I examined the plans we have available and find that there are some 161 new ETV stations called for in the various state plans. Remember that there are still 23 states we have not heard from.

What we need, then, for the immediate future is a positive possibility of doubling the number of ETV stations within the next 18 months to 2 years. In fact, we can see approximately 40 new ETV stations on the air by the fall of 1964. In addition, we may look forward to the development of 161 new stations in the various state plans as well as an undetermined number of new stations not yet completely planned for but now in various stages of planning in the 23 states from which we have not yet heard.

To me the future is bright for ETV development. Further interest has been expressed by educators to the extent that I think we can look forward to the development of over 300 ETV stations by 1966.

However, there is a growing concern on the part of many regarding the growing shortage of trained personnel. Where are we going to get people to staff the stations as well as to staff the rest of the needs of the educational television establishment? At this time, there is no evidence to indicate that colleges, universities, or vocational schools, which normally have been the source of personnel, have launched any increased program of recruitment or training to begin to match the indicated growth of facilities.

The situation in educational television is truly one of robbing Peter to help Paul. Let me give you a case in point. A new educational television station, being sponsored and developed by the school system in Charlotte, North Carolina, had need for a Chief Engineer. There were only eight people who could be interviewed for that position, and it took an awfully long time to locate even those eight. On a national basis at the present time, we just don't find qualified chief engineers to staff these new and developing stations. I'm sure that many of you will be quick to recognize that this new medium faces a giant demand for the technical skills necessary to bring these new facilities into being. The state of Kentucky, with its dramatic proposal to bring on the air on one day nine, ten or eleven ETV stations is facing a monumental job in meeting technical staff requirements. This is not to mention the production and the administrative staff needed to handle this gigantic proposal.

In addition to the ever-present concern about personnel and financial resources, another concern of great magnitude is the possible shortage of high quality programming. Although the ETV industry relies on local program production for over 50% of its programs, both academic and cultural, the indicated lack of qualified personnel leads one to the assumption that additional production agencies or organizations will also have to be developed to meet the future program needs of ETV in the United States. We assume that the new structure of NET will enable local stations to improve their programming and staff and technical capabilities as the result of the availability of some $585,000 previously turned over to NET for affiliation fees from local resources.

However, I question whether even this substantial sum will prove to be sufficient to permit local stations to engage in the type and amount of programming necessary to meet local needs, to say nothing of the program demands at all other levels of ETV activity.

On top of this very discouraging note, permit me to say that we are now engaged in an enterprise which merits our best and greatest effort to insure its proper development. I believe you'll agree with me in holding that the plus-values, inherent in education and especially in educational television, must be exploited in order that education's purposes not fail in the future. We must develop educational broadcasting in its broadest, not its narrowest, concept.

The increasing complexities of today's social, political, scientific, and economic structure requires levels of information and understanding as could not have been imagined even a generation ago. The scope of education today, of necessity, extends far beyond the classroom years to include continuing education of many kinds. It requires a degree of involvement in the community and state which makes it imperative that the investment in education be sufficiently adequate to increasingly undergird the national economy and our free society as a whole with an informed citizenry. Nothing other than adult learning can build the wisdom indispensable for the preservation and strengthening of our society. In a democracy like the United States, the basic social power has been entrusted to the people. Therefore, the people, you and I, as well as the other fellow, must continue to grow in our capacity to judge new ideas, to assess happenings in their true significance, and to judge the purposes and affects of legislation.

A Commissioner of the Michigan Employment Security Commission has said: "If you think you know all about something, you're old. If you believe you are now doing something as well as it can be done, you're old. If you're glad to admit that you know but little about these things, you're young." So I say, while we are all young, let's get on to the task of learning how we can best apply the great tools of television to the job of education this country has before it.

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ETV BROADCASTING NETWORKS

Hartford Gunn, General Manager

WGBH-TV Boston, Massachusetts

ETV networks, as a topic, would allow us to roam over almost any field, including the national network, the regional network, and state networks. I'm going to concentrate my talk primarily on regional networks. To put it in some perspective, I want to talk for a minute about the national networking picture in educational television. The character of the National Television and Radio Center has changed substantially in the past few months. In fact, it is now to be called, as I understand it, National Educational Television, though its corporate name remains the National Educational Television and Radio Center.

The changes in NET that have affected us in educational broadcasting most have been, first, the reduction of new programming to essentially five hours per week; and, second the concentration on high-level, high quality adult programming. The latter change means the elimination of many potentially good and useful, simple production adult programs, such as how-to-do-it programs, etc., and, even more importantly, the elimination of all instructional programming at the elementary secondary and college levels. Those programs which NET has in its library, as I understand it, they will continue to distribute, but there are to be no new programs produced in either of these two categories. All of this adds up, as I see it, to the fact that we can look forward to improved NET programming, but in a restricted area, and in a restricted output. And, further, this means that we must turn our educational TV station's attention to other means of performing those program services which we in educational television and education consider important.

The question arises then, how can we accomplish these services? The answer, I think, is through state and regional networking and through the development of additional program agencies of which state and regional networks would be a part. As I said a moment ago, it is my purpose here to concentrate on the regional network aspect and the assistance it may provide in meeting the needs for educational television. In doing this, I would like to give you a case study of the development of our northeastern network, which is called the Eastern Educational Network, Inc. The Eastern Educational Network is a regional, cooperative association organized to raise the level of quality and increase the quantity of its members' educational television programming. The Eastern Educational Network's 11 affiliated educational stations in the northeast stretch from Washington, D.C. to Maine, and westward to the Ohio border. Some of these stations are community-supported; some are supported by state institutions and state funds; and some are supported directly by private colleges and institutions. All of them work together cooperatively to support this privately owned and operated, non-profit, educational network.

The areas served by this network include Metropolitan Washington, Philadelphia, Pittsburgh, New York City, Schnectady, Albany, Troy, Buffalo, Hartford, Boston, southern New Hampshire, and southern and central Maine. The Eastern Educational Network is an independent non-profit charitable corporation chartered in 1960. In addition to the above stations in the above areas, its membership includes two production centers, two areas developing educational TV facilities, seven state departments of education, and two national networks. That is, on its board it has a representative each from NET and CBC in Canada.

The member stations financially support the network by means of annual assessments, which range from $150 to $3000, depending upon their class of membership. Members also support the network by making available to it their best programming free of charge. This commitment of funds and program services is significant to the support and strength of the network. The powers of the Corporation reside in a Board of Trustees composed of and elected annually by the members. A small administrative and programming staff direct the activities of the Eastern Educational Network from its offices in Boston. The staff, at present, consists of an Executive Director, a Program Manager, a Traffic Manager, and a Secretary, with engineering and legal assistance retained as necessary.

The present annual budget is approximately $45,000 for the basic staff. We have a program research project of $140,000, at present, also attached to this organization.

There are five main activities of the Eastern Educational Network. First, its function is programming, including the distribution of instructional and adult programming from four sources: 1) the exchange of the members' own programming, the major source; 2) the acquisition of program material from outside sources, including the Columbia Broadcasting System owned and operated television station, the Netramedia television stations, WNBC-TV in New York, and other sources both here and abroad; 3) programs produced through co-operative production among the member stations; and 4) programs from Eastern Educational Network itself.

A second function of the network is in planning and establishing interconnection, the creation of a systematic plan to interconnect all member stations and state networks in order to stimulate additional program exchange and generation.

The third function is activation, consultation, and support in the development of new educational stations and state networks within the region.

The fourth function is to provide consultant services, such as workshops and consultation on production, administration, and engineering to further the improvement of personnel and facilities of its stations.

And finally, research and the demonstration of regional cooperation in the field of instructional television is the role of the Eastern Educational Network's Northeast Regional Instructional Television Library Project, underwritten by a contract from the U.S.Office of Education.

Each educational station in the network faces a limitation as do all educational stations, a limitation of resources, both financial and programming. The budget, staff, and facilities of these stations are finite, and the talent pool from educational and cultural institutions in their respective areas is also limited. Some stations accept these limitations and program sparingly, and so limit the possible impact on their communities. Some stations do not accept these limitations and seek methods of enlarging their resources, their audience, and the impact of their stations. It is the vision of such stations as this that began the Eastern Educational Network, a cooperative pooling of resources, leading toward the increased production of significant educational television programming.

The concept is basically a simple one. Each station makes available to the network its best programming free of charge, whenever possible. The added programming enhances each schedule, provides for an exchange of ideas from community to community and increases the viewing audience for a worthwhile, locally produced program. Each station manager, then, can increase his program offerings, while decreasing his own production load. The money thus saved is used for special local programming, which could not otherwise be undertaken, and for the additional production of programs for the network, thereby multiplying a gain for all stations. Distribution of the network is carried on on a simultaneous, live, inter-connected basis over seven of the eleven member stations, namely, the stations in New York, Schnectady, Hartford, Boston, Durham, Augusta, and Orono. Distribution is accomplished by recorded means to Washington, Philadelphia, Pittsburgh, and Buffalo.

A word about this distribution: simultaneous, live distribution averages over a thousand hours each year of programming. The programming ranges over fields such as news, public affairs, performing graphic arts, commentary, science, social documentaries, sports, and instructional programming. It is made possible by a combination of interconnection including off-air pick-up, private microwave, and leased common carrier facilities. The coordination of this live network is by teletype communications. All state microwave and proposed interconnection systems are designed for regional network interconnection and usage.

The recorded distribution for the coming year will amount to approximately $300, and is accomplished by video tape recordings shipped via mail. Videotapes are being supplied by both the stations and the network, in the form of a tape pool.

Some observations may be in order regarding our Eastern Educational Network experience. First, the programming of all Eastern Educational network stations, as I see it, has been improved and expanded, particularly that of the smaller stations. But the improvement and the expansion of programming has been noticeable even in New York and Boston which, at the moment, are the largest stations in the Network. And these stations have benefited especially in the areas of instructional programming and public affairs programs which would not otherwise be available.

Secondly, the network itself has made possible the construction and operation of at least two stations by supplying a major program source without which the cost and operation of these two stations could not be justified.

Thirdly, the traditional barriers to the exchange of in-school instructional programs, as I see it, have turned out not to be as great as I was originally led to believe. The network has made possible the exchange of quality in-school production. We have found that not only can we distribute instructional programs, but also that we can agree on curriculum matters, and we can produce to specifications that will satisfy a ten-state region. Other less obvious advantages and observations on the network are that this network provides the climate and room for experimentation and the creation of new program ideas. It encourages the development of new talent and financial resources through offering a larger audience than a single station can command. It acts as a counterbalance to the single national ETV

Network, NET. It presents a greater diversity of opinions, and acts as a buffer against pressure on local stations. It helps to develop local station production, engineering and audience promotion skills through multi-station cooperation and the setting of standards. It provides a safety valve for the ambitions and causes that cannot be satisfied by a single national network, but which can be worked out successfully on a regional level.

If we look to the future, we have proposed an interconnection system, which, if a line be drawn from Montreal to Washington, D.C., will interconnect virtually every state in the region. Then, if you proceed from Washington, D.C., we see a possible connection with the Southern Regional Network. Beginning at Montreal, we see a possible interconnection with the Canadian Broadcasting Corporation's French and English language networks. And then, looking westward from Philadelphia and New York and the proposed statewide networks, we see a line running westward with which we would hope could interconnect with a midwestern network.

Frankly, I've been a little disappointed in the slowness with which state, and particularly regional networking is proceding in the Midwest. I don't know the reason, but maybe there is a feeling that the Midwest has all the programming and financial resources needed to perform a first-rate educational television service for its institutions and the general public. If this is the feeling, I suggest that the Midwest look again at what its neighboring states are doing and what some regional networks are doing.

I would like to close by making a plea that we give serious consideration to the furthering of the development of state networks and that these state networks be designed in such a way that they can and will lead to the development of regional networks. I think it is an inevitable next step that these regional networks will proceed with interconnection themselves and thereby create, eventually, a live national, interconnected network, providing supplementary program services, which would not otherwise, and cannot otherwise be made available by the present national educational television system.

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CLOSED-CIRCUIT TELEVISION IN AMERICAN EDUCATION

Burton Paulu, Director

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Closed-circuit television is used at all levels of American education from kindergarten through college. It is difficult, however, to determine its exact extent. The term "closed-circuit television" is variously defined, and in any case, figures become outdated as soon as they are printed. But there are at least two hundred elaborate closed-circuit systems in operation, some of which produce more hours of live television than do most television broadcasting stations, plus many image-magnification installations.

As its name suggests, closed-circuit television is a closed or private communication, the signal being sent by cable or micro-wave to selected locations. Since it is impossible for closed-circuit television to be received except on sets connected to the distribution system, it has great appeal for teachers who do not wish their presentations to be broadcast. In addition to this, however, closed-circuit has some other advantages over broadcast television. It is capable of better picture quality; it frequently is less expensive, particularly if the simultaneous transmission of a number of presentations is involved; and there is no shortage of spectrum space, as with broadcast television.

A closed-circuit installation may link an originating point with one viewing room in the same building, or with many rooms in distant cities. For example, in Washington County, Maryland, 44 public schools receive lessons over a 6-channel coaxial cable; at the University of Minnesota, closed-circuit television is used to teach students on 3 campuses in Minneapolis and St. Paul; there are television connections between Purdue University in Lafayette and Indiana University in Bloomington; and in Texas, 11 institutions in different cities are interconnected.

The most elaborate system is in South Carolina, where closed-circuit television connects 155 public high schools, 4 private colleges, 4 state colleges, the University of South Carolina, and 5 extension centers. The eventual goal of that project is 6 channels of transmission serving 725,000 school and college students, with programs from 8:00 a.m. to 10:00 p.m., providing the possibility of 84 hours of instruction per day. Unique in objective was the Chelsea Closed-Circuit Project which fed specially-produced programs to 650 receivers located in a neighborhood center, a school, and several apartment houses in a section of New York City populated by many colored and Puerto Rican families of low socioeconomic status.

The principal uses of closed-circuit television follow from some of the major problems now confronting American education:

1. Large Classes. Through a combination of live presentations and video-tape repeats, large classes can readily be taught by closed-circuit television.

2. Space Shortage. Television can help solve the space shortage, especially the shortage of large classrooms and auditoriums. A college may have few rooms seating 500 or more students, but surely will have many with a capacity of 50. Ten of these rooms could accommodate a class of 500 if taught by television, and at other times could be used for smaller groups.

3. Teacher Shortage. Television can help solve the problem of the shortage of teachers, the shortage of outstanding teachers, and the shortage of specialist teachers. Through a combination of live presentations and video-tape repeats, teachers can be made available to more students at more times. By thus being relieved of teaching some classes, teachers

may have more time to meet with students, either privately or in small groups.

4. Geographical Separation of Teachers and Students. Television can link students and teachers who normally are located in different places. Thus, university students in Bloomington can be taught by professors in Lafayette; and elementary school students in a remote South Carolina town, by teachers in the state capitol. The University of Minnesota has begun by linking its several Twin City campuses, and hopes eventually to teach from Minneapolis, students in Duluth and Morris, each of which is over 150 miles away.

5. Improved Instruction. By selecting the best teachers, giving them more preparation time, and offering them a wide range of visual aids, closed-circuit television often leads to greatly improved instruction.

6. Observation by Television. Through television, a large group may watch a demonstration without intruding on the participants. Demonstration teaching is the standard example, although one also might suggest other examples such as the recording of the administering of an intelligence test to a three-year old child, who reacted charmingly and naturally, even though later seen by 800 students via video tape.

7. Audio-Visual Aid. Certain courses benefit from television's magnification potentials. The most dramatic examples are in dentistry and medicine, although television is equally helpful in bringing map details to a geography class, or a close-up of a measuring instrument to science students. In addition, closed-circuit television can distribute still pictures and films from a central distribution point.

8. Economy. Some large-enrollment classes may be taught more economically by television. Although the better teaching of more students, rather than economy, is the proper objective. When classes are large enough 250 usually is given as the break even point - television teaching may be less expensive than conventional teaching.

Although some people assume that closed-circuit television is an all-or-nothing affair, this is not the case. In certain situations, the whole presentation may be by television, especially if the course normally would be taught by the lecture method. Usually, however, there is some combination of television and small group instruction. The lecturer may address the entire class two or three times a week, with students meeting for group discussions one or more times. Or, within a single period, the television teacher may leave time for his assistants to work with the viewing sections. It also should be noted that some classes may use television only occasionally - say once a month or even less - to present materials especially appropriate to the medium.

The list of subjects that have used television successfully includes most of those taught from the lowest grades through university. At first, those courses with visual aspects might seem "naturals," but experience has shown that an imaginative teacher and producer can develop effective television presentations in almost any field.

Although educational administrators tend to welcome closed-circuit television as a solution to some of their problems, the teachers, traditionally conservative about new media, often approach television with hesitation and doubt. In addition to concern over the absence of direct audience feedback, some professors have feared technological unemployment, and a few even have suggested that television could be used by administrators to eavesdrop on their work. All this has required those responsible for closed circuit television to be diplomats as well as educators.

Various expedients have been tried to solve the problem of the invisible student. Some teachers have brought students to the studio; but since this tends to interfere with production routines, experienced teachers often prefer to assess student reactions from memory, arrange periodic meetings with students, rely on reports from assistants, or go on the basis of camera crew reactions. In other cases, cameras have been installed in classrooms, although this too has created production problems, coupled with the disadvantage that the teacher may become so absorbed with the students before him as to forget his larger television class. But there are no hard and fast rules; all these things have been tried, and each teacher must do what he considers best.

Fears of technological unemployment clearly are not justified. The work of preparing television lectures and of revising them later when they are repeated from video-tape, plus the need to meet with students, leads to shifts in the schedules of television teachers, but not to any reduction in their total work load. The increasing use of video-tape repeats has raised questions about residual rights. An elaborate study just completed at Michigan State University brings together facts and theories about the rights and prerogatives of television teachers. The National Education Association also has considered this problem, and has compiled a statement "Professional Rights and Responsibilities of Television Teachers." Publications of this sort should expedite the standardization of procedures.

Student reactions to closed-circuit television usually are favorable, once the alternatives are realistically posed. Almost anyone would prefer to be among thirty-five students with a first rate "live" teacher than to have the same teacher on a television screen; but the choice - at least for large enrollment courses - usually is between small groups viewing television or large groups in lecture halls, with the television groups often receiving better presentations from superior teachers.

Much research has been conducted on closed-circuit television teaching. The techniques used may not always measure non-factual learning, but they do support the following conclusions.

1. Students learn from television teaching. Many comparisons of matched groups have indicated "no significant difference" between conventional and television teaching, and television teaching has been found to be superior more often than inferior.

2. Certain types of instruction are improved by television, particularly those in which visualization plays an important role.

3. On the whole, those teachers whose classes are suitable for television are pleased with it.

4. Given a choice of closed-circuit television or large lecture sections, most students prefer television.

Like all new media, television has suffered from the excessive zeal of some of its supporters, whose unwarranted claims occasionally have produced negative reactions. But let us put prejudice aside, and begin by identifying the basic problems of education, then evaluating all methods of instruction to see which best solve these problems. One method may be closed-circuit television; but we must not overlook broadcast television, radio, all sorts of recordings - film, sound, and still pictures, the many kinds of printed presentations, lectures, class discussions, and all the rest.

From these, we should select that combination which is best for a specific situation. Closed-circuit television surely has a great deal to contribute. We must not rule against it just because it is new, nor should we let the extreme claims of a few ardent proponents jeopardize its cause. We need balance of judgement in order to decide just what closed-circuit television can do for education in each situation and at each level.

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AIRBORNE TELEVISION SYSTEMS

Benjamin Bohnhorst, Acting Vice-President

Midwest Program on Airborne Television Instruction

I'm especially grateful for the opportunity to talk about the Airborne Television in terms of concept. Allow me, if I may, to concentrate as best I can on the concept of the system and mention little, if nothing at all about the techniques of operation and the several things we've done in the MPATI program. I also would like to concentrate upon this concept as it has developed in our Midwest Program and give minimum attention to the other aspects of the concept such as the applicability of the airborne system to other parts of the country, to underdeveloped foreign areas, and as a possible prototype for satellite communications.

Westinghouse Electric Corporation, in the report entitled, "Educational Television Distribution, Report No. AA3754", discusses the various means of transmission including an airborne system on a nationwide basis. The interest of this company is representative of the kind of interest that has been recorded for using the airborne system in other parts of the country. There have been one or two other regions that have given at least tentative or casual interest in the application of this system to their areas. Missouri and Texas are two of these regions.

I think, in all candor, we ought to realize this system may or may not be applicable in other parts of the country. It may become increasingly clear that what is central to this concept is a system for finding a sufficiently broad base of resources, talent and money which can be pooled to do the tasks that we set out to do. It may be that certain parts of the country, or regions of the country, are too sparsely populated, for instance, to make this kind of system an economic and feasible approach. Also, in the Midwest we have been able to mount this system in a circular or signal area that has a kind of functional relationship to itself. Now, in California, and functionally that state is strung up and down in a long north-south orientation, with most of the population concentrations along the coast and along most of the inner edges of the state mountains and desert. To impose a circular airborne television pattern on that area may not be appropriate. Topography, itself, in the mountainous areas might create special difficulties in providing signal strength down in the valleys and over the crests, because after all, an airborne system is a line-of-sight system, and shadows create difficulties.

Let me turn to other parts of the world. It was very much a part of the original concept of airborne television that this system might very well indeed have applicability overseas, particularly in under-developed countries. There, again, has been some informal, casual interest in one part of the world or another, but no concrete negotiation or planning is now underway in this regard.

So far as satellite communication is concerned, a document entitled, "Demonstration Broadcast Satellite," prepared by the General Electric Corporation is worth reading. The authors of this report were visitors to the MPATI program recently to share their thinking with us and to explore with us whether or not there might be some mutual interest between the MPATI project and the demonstration they are proposing in their report. I think the General Electric people may have been particularly interested in MPATI as a source of programming but, also, in our experience in placing an airborne telecaster into the air, and from a single source accomplishing simultaneous channel broadcasting of instructional materials.

But let me concentrate on the concept as it has worked out in the midwest area itself. I would like to make one or two preliminary remarks and then discuss the concept in terms of an analysis of the educational crisis that we are facing in the twentieth century. It is such an analysis of that crisis which stimulated the generation of the concept in the first place. I would like to characterize some of the features of this concept, and then I would like not to leave this podium until I have pointed out that the concept that we have to discuss is now at issue before the FCC with the recent issuance of a notice that the FCC would rule on an application that MPATI filed last January.

There is a basic question that I would like to try to formulate, a basic question underlying the whole issue. Please forgive me if the basic question formulated may seem an unwelcome question.

I wanted to borrow some phraseology from Walter Stone. I think the basic question is: Can instructional television really successfully become of education, rather than merely in education? Can it really?

It is exciting to hear all the things that are happening up and down the country. This may be the unwelcome question: Is it enough? Well, I think the answer to the question is yes. Yes, it is enough in terms of the heroic efforts devoted to this project and in terms of the potentials within the framework in which we presently operate. But I want to ask the question again, is it enough, in terms of the problem, in terms of the need, in terms of the situation that we are facing? I would like to ask the basic question in a couple or three ways.

Can instructional television successfully become of education until we have multi-channel service sufficient to handle the numbers of students that we are trying to serve, and not only the numbers of students, but the scope of curriculum needs that this multitude of students has. Are one or two channels available in any given school enough? Can instructional television successfully become of education until we have, or have some prospect of getting, ample high quality programming - emphases upon quality.

Can instructional television become of education on a multi-channel basis, with ample high quality materials, in a manner, and at a cost that we can afford? We need quantity, both in terms of numbers of students and scope of curriculum. We need quality, without question, and we need it on an economic base that we can afford.

Well, first, let me speak of some of the preliminaries. I would like to recite where MPATI stands with respect to some of the steps that have been taken. As you know, airborne was tooled-up in 1959. The period from 1959 to 1961 was in effect the tooling period. As has been mentioned, when we began demonstrating telecasting on a full schedule basis in 1961-1962, MPATI had been up until that point a private, experimental project. It became incorporated as a non-profit corporation in the state of Indiana in January of 1962. We had our first meeting of members of the corporation about a year ago and elected our board of directors. We applied for regularization of airborne telecasting and 4-6 channels last January. On October 24, I believe the day was, the FCC issued its notice that it would make a rule on the MPATI application. These are the steps we have gone through.

But let's look at the concept now. First, the analysis of the crisis in education, the particular analysis which gave birth to the airborne concept. We have heard a lot, and it has become commonplace, about the explosion in population. Nothing more need be said about that, except to point out that this explosion in population, in our student population, in particular, places a tremendous drag upon our educational enterprise. We have also heard, and usually mention separately, about the explosion in knowledge. John Goodlad in the Saturday Review, recently sought to describe this explosion in knowledge. He stated, as I recall it, that it was around 1750 that knowledge had doubled from that available at the time of Christ, and by about 1900, it had doubled again; that by 1950 it had doubled again; and by 1960, it had doubled again; and it looks like it may more than double by 1970. This is the kind of geometric progression in the discovery and accumulation of knowledge that we are experiencing in our mid-twentieth century. This, too, places a tremendous drag, a tremendous challenge, upon our educational enterprise.

A third factor in the analysis of our contemporary crisis is the fact that being the twentieth century, and given our system of education and the way we finance it available funds for education are becoming less and less available. It is harder and harder to get tax bills passed. It is harder and harder to find the funds to operate our educational enterprise. Our analysis that generated the airborne system put these three factors together into a single analysis. It recognized that all three of these factors are colliding in the mid-twentieth century. We have this double drag on the educational enterprise from the population increase, the demands for increased quality, and the explosion of knowledge at a time when, even though education is bound to cost more, it is going to be harder to find the additional moneys. So the question, how can you meet the demands for quality and quantity in the most economic and efficient and effective manner with a minimal increase in costs?

The airborne system was devised as a system that could confront this crisis with a single approach - using airborne transmitters to cover quantity. With multi-channels, the scope of the curriculum could be embraced, quality could be improved and resources of time and money could be pooled. All of this could be organized on such a broad base that the cost to any particular locality would be minimal. So all three factors were envisaged in the origin of the concept. The operations have been carried out in faithful pursuit of the concept, MPATI gone through certain stages of maturity, but, still, it is by no means a mature concept.

I like to think of the project as having passed through periods of conception, gestation, and birth in the tooling-up process. Then, the demonstration period and the first year of broadcasting were its infancy and childhood. I believe it is fair, now, to look upon the MPATI project as a fairly lusty adolescent, but it has the rocky road of adolescence to go through before it reaches maturity. Someone commented about adolescence the other day that it was characterized by rapid growth and development between the ages of 14 and 17; during which many parents have been known to age 20 years. We are aging about 20 years as we work with this fascinating project right now.

Well, now, having indicated this as the origin of the concept and that behind the concept lies the three-fold crisis of our times, let me suggest four key features of this concept. First I should like to suggest that the technical system, the airplanes and all the hardware, in itself is not the important thing. It is important only insofar as it makes it possible to organize a public instrument for dealing with public problems - an educational enterprise to deal with educational problems. By mounting the antenna at a height of 23,000 feet it becomes possible to serve a region and to create and organize a regional system that can pool its resources of talent and money, to achieve high-quality programs in ample quantity at minimum cost to the individual consumer. So the technical system is not in itself the important thing.

The second feature of the concept is that the problems of program supply, of program quality take particular precedence over the technical system. Hence, the need for a multi-channel service is symptomatic of the underlying needs for quantities of quality.

The third feature of this system that it has a potential to serve as a multiplier mechanism. Sometimes I think there are quarters in which the airborne system is looked upon as a voracious beast that wants to gobble up channels. Sometimes one thinks of Henry VIII ripping the vest apart and gobbling off the breast - you know, this kind of belching and burping image. On the contrary, this system can be related in image and impact to the TVA and its effect upon the south. There were some dislocations in order to implement TVA, but the economic development, the cultural development, the educational development, indeed the defense development in World War II that generated from TVA indicated it as a model of the sort of thing that can multiply beneficial effects on all sides. This system, either in this region, or wherever, ought to be able to operate in such a way that it fosters the development of ground-based instructional television operation. In the Chicago area, there is station WTTW, Channel 11. WXXW, Channel 20, will be in operation in September. What we have in view here is a cooperative plan for schools in the Chicago area to obtain a four-channel service beginning next year. With coordinated planning of reception from the MPATI sources and the ground-based sources in this community maximum economy should be realized for the schools in the area. A similar plan is under consideration in the Cincinnati area. It may have the prospect for putting WCET, which has certainly been one of the pioneering stations in the country, on a sound financial footing. It is for this purpose that we are entering into the cooperative plan proposed in Cincinnati.

The Kentucky network is very much interested in cooperating with the MPATI operation. I think we have a memorandum of agreement signed with the state department of education in Kentucky. I think I interpret the developments as meaning that the Kentucky network has seen again that one of its major problems is a financial problem and that it's going to cost them a whale of a lot of dollars to build the hardware system that represents their state-wide network. MPATI is a source of programming which, in this cooperative arrangement, can help out Kentucky with the development of its network. Indeed the contemplation is that programming to supply a network of state-wide scope may cost as much as to place the figures in the same ball park as the cost of the hardware itself. The production centers that are involved in a regional system of this kind have benefited from the participation. A regional system of this kind can practically and feasibly create the library of quality materials that shall be needed.

I hope that something of this sort will develop. A sharing of channels between ground-based and airborne operation so that a given channel allocated to the region can be shared in the daytime hours with an airborne system, and programmed in the afternoon and evening hours from the ground bases.

But now let me point out this concept is at issue before the FCC. Mention has been made of the July ruling regarding the 2500 megacycle, instructional fixed service availability. This means that the FCC, as I look at it from where I sit, is attempting to respond to the multiplicity of needs of the community and of the nation as a whole. They are making provision for multi-channel services. They are making provision for non-commercial broadcasting. They are making provision for the commercial broadcaster, or proposing to do so for the nation as a whole. But the issue, as it is posed for consideration with respect to the MPATI six-channel application is whether or not a multi-channel service on a regional basis for the pooling of resources on a broad base is in the national interests. At least this is the way I see it. I commend to your attentions not only Docket 14229 but, also, Docket L5201, the notice of MPATI application.

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WHAT ARE THEY DOING IN OTHER COMMUNITIES?

When the rooster escorted the hens to see an ostrich egg just to let them see "what they are doing in other communities" he may have been suggesting the impossible. However, a glance at the educational television developments in many communities, states and regions of this nation suggests that much more is in the realm of possibility if only someone is willing to make the try.

Higher education in the South has a firm grip on its own bootstraps, and it has been tugging away at them for several years with results which have attracted the rapt attention of higher education throughout the land. Educational television has been a factor in this effort, and today more than one-third of the ETV stations in the nation are in the 16 states comprising the region encompassed by the Southern Regional Education Board.

State networks figure strongly in the plans of most of the states in this region. In several states they are realities, base stations are operating in other states, and inter-commectionsometime in the future seems a foregone conclusion. The SREB, in fact, has projected the needs of the 16 states for ETV channel reservations at 330, 231 more than the 99 channels now on the air or reserved for education in these states.

Program content ranges from an attack upon adult illiteracy to post-graduate and continuing education in medicine. Television is a major tool of many agricultural extension programs, teacher training employs the medium extensively, many aspects of teaching in nursing, medicine and dentistry employ television, and higher adult education finds television a major vehicle to reach an education-hungry adult populace.

ETV pioneers are beginning to notice a change in "the ole gang" that once wept on one another's shoulders when they met to decry the lack of interest in their explorations. Today, however, they say strangers in the persons of community leaders, legislators, and educational administrators are popping up in the educational television seminars as the potentials of ETV have begun to seep into the conscience as well as the consciousness of the public. Stronger evidence is provided by legislative actions providing funds and authorizing state networks in some states.

Then, at the top of the map there is considerable excitement over the rapid expansion of educational television. A regional network is comprised of 11 stations stretching from Maine to Washington, D.C., with 7 of the 11 stations inter-connected for live distribution of programs by a variety of methods and means. The four not yet connected affiliates are serviced through video tape recordings. The dreams for development of this Eastern Educational Network, Inc., still stretch out beyond the present accomplishment. Maine is about to have a full-scale, state-wide network in operation, with a variety of ownership arrangements including one station owned by a combination of private colleges, another by the state university. Satellite transmitters and translator stations figure in the spread of educational television in New Hampshire and Connecticut as a means of covering an entire state with transmissions from one base station.

Another recognizable trend shows itself in the northeastern states, the need for a second educational channel in thickly populated areas in order to provide the service literally being demanded of educational television. Boston, Philadelphia and New York are proof points of the fact that a single channel expertly operated can not supply the demands for educational television fare.

Over the Alleghenies to the central states, from Michigan to Oklahoma, and from Ohio to North Dakota, there are 27 ETV stations operating with much activity directed toward the establishment of other stations. Only Indiana does not now have an operating ETV station. Virtually every state has some surveying going on looking toward state networks. The six states of North and South Dakota, Minnesota, Nebraska, Iowa and Wisconsin have organized Midwestern Educational Television, Inc., looking to the establishment of an inter-connected network. At this time they are just beginning regular program exchange services among the states.

One flare goes up from an ETV pioneer and an astute observer of the midwestern scene with respect to educational television. After many interviews with the legislators, he harbors a gnawing feeling that the legislators may be ahead of the educational administrators in their thinking about television as part of the solution to the problems of education even to the point of expecting it to require an investment of additional tax dollars.

In the western states, activity in educational television suggests a rough division of the states into those which are active and increasing their activity rapidly (Washington, Oregon, California, Arizona, Utah, New Mexico and Colorado) and those sparsely populated states in which educational television is only in an early stage of development (Nevada, Idaho, Montana, Wyoming, Alaska and Hawaii).

Another regional educational combine, the Western Interstate Commission for Higher Education, has taken a hand, and through its devices it is creating a greater awareness of the possibilities for creating expanded educational opportunities for Western youth among educators and the public alike through employment of the television medium.

Educational television in all its forms is no longer a novelty, a temporary phenomenon, a plaything for the adventurous, a gimmick, or just so much hardware. The old cliches for passing off that which offers new vistas but presages changes in the old order are no longer good. The instrument has proven its value in most every situation and circumstance in education, better in some instances, weaker in others, but, in the main, it has shown an educational effectiveness equal to the conventional way and sometimes better, seldom worse.

Gradually, but at an accelerating pace, individual units are being organized into combinations for sharing the best that has been produced. The vestiges. of early preoccupation with the commercial methods of using television are disappearing. Seeping into the pores of our educational systems is the realization that the tube may soon be as common to the classroom as the chalk, and that a major part of the population will spend some time with the dial turned to a station concerned only with building the informational, educational, and cultural levels of the nation.

ETV DEVELOPMENTS IN THE UNITED STATES BY REGION

Northeastern States

Hartford Gunn, General Manager

WGBH-TV Boston, Massachusetts

Activation of new ETV stations in the Northeastern region of the United States is increasing. We have a number of stations in the planning stage and quite a few stations in operation.

Running down through the states: In Maine, WCBB, Channel 10, is on the air and is owned and operated by Colby, Bates and Bowdoin Colleges, under the name of the Colby, Bates, Bowdoin Broadcasting Corporation. In addition in Maine, WMEB, Channel 12, began operations in September of this year. It is owned and operated by the University of Maine. WMEB is the key station of the Maine state network, which, when finished, will include not only WCBB and WMEB, but WMEM in Presque Isle and WMEC in Calais, providing a complete state network. This Maine state network is connected to our regional cable educational network in Boston by means of private microwave which runs over 300 miles to provide the service for the state.

In New Hampshire, we have a station, WENH-TV, in Durham. It has been on the air since 1959 and is under the control of the University of New Hampshire. Present plans of the university are to increase the power of WENH-TV in the coming year and to provide a complex system of translators and satellite transmitters to provide complete state-wide coverage within the next three years.

In Vermont, the bond issue before the state legislature for the construction of an educational television network was defeated last year. The University of Vermont continues its planning however, and is now working on a proposal to present to the next legislative session in 1965. We think it has a better than average chance of passage.

In Massachusetts, WGBH-TV has been on the air since 1955 and will move into its new $1,400,000 physical plant in June of 1964. Proposals are now underway for a second educational television station in Boston, and the twenty-one inch classroom, the school broadcasting service in Massachusetts, has installed satellite translators in the western part of Massachusetts to provide coverage in the Connecticut Valley area of the state.

Rhode Island is planning for an ETV station to be completed in the next one to two years. The proposal goes before the legislature in January, 1964.

Connecticut, Channel 24, WEDH, in Hartford, began operation in September of 1962, and serves all of central Connecticut. A satellite transmitter is being installed in New Haven, and several others are planned to provide nearly state-wide coverage.

In the state of New York, there are three ETV stations in operation. The first, WNED-TV, Channel 17, is in Buffalo; the second is WMHT, Channel 17, serving Schnectady, Albany, and Troy; and the third station, ~~WNDC~~ WNDT, is located in New York City, but licensed to Newark, New Jersey, and serving northern New Jersey, metropolitan New York, and southern Connecticut. Planning is already underway in the state of New York for additional ETV stations in Rochester and Syracuse, and ETV Councils have been active in the cities of Corning, Binghamton, Watertown, and Utica. There is a possibility of stations being activated sometime in the next five years in those cities as well.

Pennsylvania has become increasingly active. WQED and WQEX in western Pensylvania, Pittsburgh area, are the oldest stations in the region. They are now supplemented by WUHY, the UHF station in Philadelphia, and WHYY, the new VHF station in Philadelphia. The latter is a maximum power station licensed to Wilmington, Delaware, but serving the Philadelphia area, southern New Jersey, and most of Delaware. Future plans in Pennsylvania include the activation of Channel 3, Clearfield, operated by the Pennsylvania State University, and additional stations to come along in the cities of Erie, Harrisburg, and Allentown.

In New Jersey, the New Jersey Educational Television Corporation plans a state-wide network. Until the activation of that network, which seems to be some years in the future, they are actively cooperating with WNDT in New York and WHYY in Philadelphia, which serve a major part of the state.

Delaware, as we mentioned a moment ago, is the home of WHYY, and is served almost entirely by the joint Philadelphia - Delaware - New Jersey station, WHYY, whose studios are in Philadelphia and in Wilmington.

The state of Maryland has a proposed state-wide network, with plans to activate the station in Baltimore, Maryland, as the first step. The plans are still being worked on; as far as I know, there is no on-the-air date proposed for the Baltimore station or for the proposed state network.

The District of Columbia is the home of WETA-TV, the community station in the district. It cooperates closely with the surrounding states of Virginia and Maryland, and is actively engaged in increasing its power and improving its facilities to provide better coverage to the district and service to the surrounding states.

For some unknown reason, I was asked to include as a part of my Northeastern report some information on Puerto Rico. I know I've been accused of being an empire builder, but I want to assure you that we have no plans for a submarine cable to Puerto Rico and tie them into our network. I certainly can't report much on the state of educational television in ~~Peurto~~ Puerto Rico. I know it has one major station in San Juan, and at least one or two satellite stations which repeat the main station.

Just one or two observations before I close my report on the Northeastern section. Becoming obvious to all of us in the Northeast is the growing importance of networks, first on the state level and, of course, on the regional level. We have one complete state network virtually in operation in the state of Maine, which incidentally is one of our poorest states. It's interesting to see that where the financial needs are such and the resources of the state, both financial and educational, are limited, the importance of networks comes strongly to the fore. It is interesting and, I think, significant that Maine is the first state in the Northeast section of the United States to have a complete state-wide inter-connected network, and a network, by the way, which is capable of origination at two points. While controlled from Orono, the home of the University of Maine, there is provision for the creation of programs down in the Portland area some hundred miles or so to the south, as well as at the University. In addition, all of these state networks-this is again seen in the development of the Maine state network - are being designed for regional interconnection.

Another observation on the developments in the Northeast is the growing importance of the activation of a second channel in major metropolitan areas.

Already in Philadelphia and Pittsburgh, Pennsylvania, we have a second channel on the UHF band, supplementing the main channel, VHF. WNDT in New York City plans a second channel and we already have a second piece of paper on its way to the Federal Communications Commission asking for a second channel for Boston. So I think it is a significant development in the Northeast, that in these major metropolitan areas, we are more and more coming to the second channel in order to handle the complete needs of sizable populations.

In conclusion the Northeastern sector of the United States is certainly one of the last areas in the country to get the religion and develop educational broadcasting for radio and television, but it seems to me that the activity that has taken place in the last couple of years, coupled with the planning that is now going on, indicates that the Northeast section of the United States will assume a role at least comparable to other sections.

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ETV DEVELOPMENTS IN THE UNITED STATES BY REGION

SOUTHERN STATES

Edward P. Wegener, Director

ETV Department, Auburn University

Well over a third of the educational TV stations in the United States are found in the 16 states we call the Southern Region. This goes from Texas to West Virginia. And this is only a start.

I think the important thing to know regarding ETV development in the South is that it is no longer just a convention subject for a few enthusiastic educators and practitioners. In our region the message has reached the believing ears of the power structure of the several states. People who make things happen are now engaged. The Tennessee legislature did vote a million and one-half to finish the state network this year. The Kentucky legislature voted to build an 11-station network. The Alabama lawmakers gave the Alabama ETV commission another half-million to add to Uncle Sam's to further enlarge the four-station network in Alabama. The Arkansas legislature shelled out with $850,000 to get things started in Arkansas.

When I attended an SREB regional meeting last year in Atlanta to continue our regional considerations in ETV development, I could recognize only a few of those people around the table. In previous meetings it had been broadcasters and educators. Last year administrative level folks from universities, a bank president from Richmond, Virginia, state ETV commission representatives, even a legislator or two were there. The change in the cast of characters seems to me to be one of the significant changes I would like to report on concerning our region.

Now, let me come 90 degrees around and start all over again. I have thought of calling this report, go south, young man, go south! If there is a frontier left in America, it is down South. The excitement does not lie alone in the rate of growth of educational television in our region. It is true that Alabama, next to the poorest state in the country, poorer yet than Maine, built the first state network and continues to enlarge it. True, we have more than a third of the stations in the South, and they will come closer to one-half when Kentucky gets its 11-station network on the air. But I'm not a bricks and mortar man, rather a kilowatt and coverage addict. I think more of who and what are going on in these stations.

Now, I could bore your ears off with the bread and butter programming that goes on, and I am completely committed to bread and butter service programming, because I learned well during my professional life in land-grant colleges and for 11 years under the tutelage of Dick Hull at Ames. I would rather point out for you a couple of people we call our own in the South and tell you why I think they make it exciting. Ken Christianssen is director of broadcasting in Florida. He is a hard-thinking, hard-talking, no-nonsense kind of person, who always questions and tests our premises for ETV activities and projects. George Hall, at Raleigh, North Carolina, is trying an idea that throws out all the cherished trappings of a TV show, all the theatrical distractions in order to make of the receiver a flexible teaching machine. Our imaginative friend over in Athens, Georgia, produced, with a ridiculous budget, one of ETV's most provocative and shaking-up series called the "Basic Issues of Man."

Somebody is always reminding me that we have doubled man's supply of knowledge in the last few years. That's supposed to mean that we must educate more and better, but it doesn't touch things we have known for 5000 years and still haven't taken unto ourselves. That's a better reason to have television in education. We know in the South that we all need education. We know it very painfully, not only in the fresh knowledge but in the old and long-known, as well. As long as a student radio announcer, in a little commercial station in Auburn, can report a truckload of sheep overturning downtown Auburn and tell the folks that "ee-wees" were running all around the street, and as long as a newspaper reporter in a New Jersey city can take a picture of our President Johnson and General DeGaulle down the street, and only find five out of 50 people who can identify the two men, then we need education just to survive as a self-governing people.

In West Virginia, there are no stations on the air now. Plans are afoot for two stations within a year, and it is possible that novel arrangements with private antenna cable companies will be worked out for the remaining coverage.

In Maryland, I include the Washington, D.C. ETV station. In addition Hagerstown has its county-wide closed circuit system and 3 stations are projected as well as an eventual six-station network.

Virginia contemplates a state network and those other stations indicated by dots as projected. Richmond seems to be about the next station ready to get on the air. The people who really move things are beginning to get involved. For example, the president of a bank in Richmond, is very deeply involved.

In Kentucky funds for advance preparation for the 11-channel state network have been requested of the legislator, one station at Louisville is on the air now.

North Carolina has at present one transmitter, WUNC-TV, being fed from three of the state universities in the state university complex. Other stations are being planned.

In Tennessee, Memphis and Nashville are on the air. Chattanooga will probably have a station on the air in another year. Channel 2, in Sneadville, will be a station of wide coverage. It will reach as far as the state university of Knoxville and will be fed from studios at Knoxville and from East Tennessee State College.

In South Carolina, there is a thriving closed circuit operation reaching into every county in the state. Two additional station locations are projected.

In Georgia, Athens, Atlanta, Way Cross, and Savannah are now on the air, and another on the western border at Pine Mountain, Georgia, will be the next station on the air. It will be UHF, as most of the rest of the stations in the state.

In Florida, two stations in Miami, and one each in Tampa, Gainesville, Jacksonville and Tallahasse are operating. They run a network by tape, though there is one interconnection between Jacksonville and Gainesville.

In Alabama, there are four transmitters on the air. A fifth is just about ready to go in Mobile.

In Mississippi, Mississippi State College, Channel 2, very likely will be the first one to get on the air.

The University of Arkansas has inherited a president who was well trained at Auburn and is committed to educational television. I expect that Arkansas will very soon start moving. The first station will not be in one of those places where you might expect it - Fayetteville or Little Rock. It will be a little town west of Little Rock where they have inherited a defunct commercial station and are planning to activate it for educational use.

In Louisiana, two stations are now on the air, and one is projected.

In Texas, five stations are now on the air and three more are projected.

This is a pretty fair appraisal of what our region will look like in the five-year period.

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ETV DEVELOPMENTS IN THE UNITED STATES BY REGION

Central States

John Schwarzwalder, General Manager

KTCA-TV St. Paul, Minnesota

An extraordinary amount of effort and activity has been apparent in ETV these last five years in the Central States of the United States.

In North Dakota, a station in the Fargo area is prepared to go on the air in January of 1964. It will cover a great deal of Minnesota as well. The second station will cover Grand Forks, Fargo, and a very very large area of the eastern part of South Dakota. It is scheduled to go on the air in late 1964, from a tower which is 2,073 feet tall, the highest tower in the country. The tower, incidentally, was built for a commercial station, which has made plans to put this Channel 2 operation on it. Plans for a state network are now being considered by the office of the Superintendent of Public Instruction there.

In South Dakota, KUSD-TV in Vermillion has been on the air for two and one-half years and has been a pioneer in the establishment of the southeastern South Dakota ITV Council consisting of 10 public school districts. A survey and report looking toward the establishment of an ETV network for the entire state is now in the hands of the printers. Legislative study will follow immediately, and it is hoped that legislative action to begin activation of such a state network will be taken in early 1965.

In Nebraska, in addition to the ETV activity at KUON-TV, which is one of the oldest and strongest ETV stations in the nation, a survey and report looking toward the establishment of a Nebraska state ETV network has recently been completed. This report resulted in action by the legislature by a margin, incidentally, of somewhere around four or five to one, which established a state ETV commission. The legislature also appropriated $600,000 towards the activation of the network. The Nebraska Council for Educational Television has pioneered in the cooperative presentation of in-school credit courses.

In Kansas, the legislature failed by just one vote in one house to approve a state-wide plan for educational television. However, a municipal college in Topeka and the state college in Wichita are now looking toward the establishment of an interconnected network of ETV stations in that state. In addition, public school use of ETV in Kansas, which goes back at least five years, is steadily increasing through the cooperation of commercial channels. Throughout the region one can find commercial channels cooperating in the presentation of in-school courses.

In Minnesota, in addition to a strong educational television station in Minneapolis-St.Paul, which broadcasts programs emanating from 61 school districts, 18 colleges and universities, other ETV actions during past years are now about to bear fruit. A new station on Channel 8, in Duluth-Superior will go on the air in early 1964 and will be interconnected with KTCA-TV in St. Paul. Funds for the interconnection will be granted by a foundation. The necessary funds in Duluth-Superior have been raised and deposited in the banks. In addition a station on Channel 10 in the west central Minnesota area will be on the air in late 1964. The legislature had already made a small appropriation for that one and it will be interconnected with KTCA-TV.

There is a study sponsored by the NAEB and the Hill Foundation now underway to determine the feasibility of establishing an ETV station in the Austin-Aberdeen, Mason City, Iowa, area. North St. Cloud State College has asked for reservation of a UHF channel in the area of northcentral Minnesota. Plans for interconnection of all these stations are well advanced. And finally the Twin City Area Educational Television Corporation, which operates KTCA-TV, has applied for a construction permit for a UHF station in the Minneapolis - St. Paul area, since the facilities of one channel are no longer adequate for all the institutions which wish to use the station.

In Iowa KDTS-TV in Des Moines is an outstanding public school station. In addition seven north central Iowa counties have done excellent ETV work on a commercial station during the past four years. WOI-TV, a commercial station owned by Iowa State University continues to program "Iowa Schooltime." WOI-TV was a pioneer ETV outlet. In large portions of Iowa, schools and many colleges are expected to be served by ETV stations located in Nebraska, South Dakota and Minnesota. They have indicated their willingness to support and participate financially in the programming of such stations. Here again, I think is something worthy of note, the financial participation in ETV programming that goes well beyond state lines. Wisconsin schools are actually sending money in to Minnesota for the purpose of helping to produce TV programs. Iowa schools are giving money to Nebraska for that purpose. All over the region we find that state lines are not much of a barrier.

Missouri supports two ETV stations: one, a community station in St. Louis, which is used by many of the schools and some of the colleges of the area. Another, a public school owned station on UHF, is in Kansas City. The latter is doing excellent work in in-school programming; the former concentrates to a large extent upon cultural programs, although it also serves in-school purposes. In addition, the University of Missouri in Columbia operates a commercial station which programs a considerable amount of educational television, records courses which are used elsewhere and trains personnel for ETV.

In Michigan, there are stations operating at present in Detroit and East Lansing, with translators in Onnandago, in western Michigan, and in Mt. Pleasant. The Detroit station is cooperatively owned and operated by the Detroit public schools, Wayne State University, and the University of Detroit. Its schedule has increased during the past year, almost doubling in that time. It devotes most of its time, but by no means all of it, to instructional programs.

The station in East Lansing, owned and operated by Michigan State University, started out originally as a UHF station; and since 1959, has been sharing a commercial VHF channel. It offers credit courses and has served as a training laboratory. The station in western Michigan offers a varied program, including instruction by television for that area of the state. Mention should also be made of the activity at the University of Michigan, which, though it does not yet operate a station, has been actively providing programs of an informational nature for more than 60 other television stations, both commercial and educational.

Mention should also be made of various state plans and surveys looking toward interconnection of all these facilities in Michigan.

Wisconsin has three operating ETV stations, one at Madison, owned and operated by the University of Wisconsin, the other two at Milwaukee which are owned and operated by the Milwaukee Vocational Schools. The second station in Milwaukee, again, is a UHF station which was necessitated by the fact that the original VHF station could no longer accommodate all the institutions wishing programs. A state-wide plan has recently been completed in Wisconsin looking toward the establishment of six additional channels in that state. Interconnection between the Madison and Milwaukee stations seems assured within the next six months.

The state of Illinois has three operating ETV stations: one in Chicago, one in Champaign-Urbana, and one in Carbondale. All three are VHF stations. The first is owned by a community, non-profit corporation, the second by the University of Illinois; and the third, by the University of Southern Illinois. A state-wide survey which would endeavor to formulate a plan to cover the entire state of Illinois by ETV is presently underway.

Indiana is the only state in this region, and one of the few in the eastern part of the United States, which does not have an operating ETV station. Application for an ETV station has recently been made by **Indiana University** and a construction permit has been granted. A very considerable amount of in-school ETV programming has been done cooperatively in the Evansville area by means of commercial channels.

Ohio has six operating ETV stations, has applied for two more such stations and has completed a state plan for an interconnected state network which would involve no fewer than 26 transmitters. A state ETV commission has been authorized and is actively attempting to implement this service. WOSU-TV in Columbus has pioneered the production of college courses. In cooperation with the Columbus and other public schools, WOSU-TV has done a great deal of useful in-school instructional work. The same could be said of WCET in Cincinnati, and, indeed, many other Ohio stations.

Oklahoma has two operating, inter-connected ETV stations under the authority of the Oklahoma ETV Commission, in Norman and Tulsa. Another UHF-ETV station is operated by the school board in Oklahoma City. Plans for extension of ETV services in Oklahoma are now under active consideration.

The ETV stations in the six states of North Dakota, South Dakota, Nebraska, Minnesota, Iowa and Wisconsin have joined together to establish the Upper Midwest Educational Television Regional Network. The initial survey of feasibility was followed by a project on exchanging of programs. This in turn was followed by a joint production project. The stations concerned, under the leadership of Midwestern Educational Television, Inc., a non-profit corporation established for the purpose of operating the network, are now implementing a regular exchange service. The cost of this service [redacted] will be supported by the member stations themselves. Portions of the network will be interconnected in the very near future in St. Paul, Duluth, Vermillion, Lincoln, and a number of other links. The complete interconnection is hoped for within the next two years.

The Great Plains Instructional Television Library serves this region as well. Another report will be made on its activity, but it should be noted that the use of the courses approved by that library has had a startling increase in the past year.

It will be noted that as of this date there are 27 ETV stations operating in this region of the United States and that many additional applications for construction permits, channel reservations, and applications for matching funds have been filed or are about to be filed.

It is also obvious that steady progress in terms of feasibility studies, programming studies, and engineering studies has been made. The legislatures of at least ten of these states have in one or more actions taken favorable action toward ETV and toward the establishment and/or operation of ETV facilities. The audiences of these stations appear to be growing in every area. The attitudes of administrators, while most difficult to assess, appear to become more encouraging. Important progress has been made and there is every reason to believe that it will continue.

I am going to take five minutes - no more - to discuss a few other things which have become important in this region.

One of these is a rather technical matter, but I mention it because it has been extremely difficult for both administrators and state government, and especially for the FCC to understand what we are about in some of these state network plans.

I recall the former Secretary of the Interior and the Senator from Nebraska, Senator Seaton, saying to me, "Why in the world are you locating a transmitter in that town? My God, man, there are two state senators from North Platte, and North Platte has a population of 25,000. Put the thing in North Platte." I explained to the senator that this is FCC reasoning which thinks in terms of a market. We are talking about coverage of an entire area, and that means that the transmitter does not necessarily bear any relationship, whatsoever, in a production facility. Similarly, there is a new state plan which puts a transmitter in Roscoe, South Dakota, which is a hamlet of perhaps 175 people, instead of the third largest city in the state. Here again, it's a matter of coverage. The production will come from the universities and from the major school systems.

I mention this especially because I saw a criticism by FCC engineers, as reported in the trade press of the NAEB channel allocations report saying, "Yeah, well we could have put them out too, but they've got stations allocated in little places of less than a hundred people. It may well be that the location which happens to contain less than a hundred people is exactly the location where that transmitter should be placed in order to insure maximum coverage in terms of a state-wide or a regional plan. This is an extremely important matter, and I think it ought to be brought forcibly to the attention of the state government on the one hand and to the FCC on another.

The second thing that I call to your attention is the leadership of the ETV stations in this area with respect to educational problems. Sometimes we're accused of being technicians or administrators, or worse. Yet, when one considers the Nebraska Council on Educational Television, which was a pioneering effort in bringing together a large number of separate school districts of greatly varying sizes, the record is impressive. The Council and the schools determined what their common educational goals were, and then determined in what way they might be aided by educational TV. The leadership on this sort of thing, of course, came from the station manager in Lincoln. Similarly, in councils constructed in South Dakota, Ohio and Minnesota, most of the leadership came out of the ETV station. I am reminded also of a station which is now doing the nursing training for nurses in five hospitals.

The very matter of state surveys themselves, generally speaking, to determine the feasibility, the practibility, of establishing an ETV network, have not come out of state departments of education nor indeed, out of educational institutions.

It has been the ETV stations themselves which have pioneered in this sort of work. I think it's time, however, that administrators, state departments of education, state boards of regents, and presidents of very large state educational complexes began to realize that it is time they also did some of this new planning.

Now, about this matter of the attitude of administrators and the change that should be made in it, I think I begin to see a way of convincing them, and I wish that this were on the merits of the case alone or on brilliant, pure logic. I think, however, that the convincing is being done in other ways. Through my peculiar experience - I was going to say privilege - in the last two years, I have talked personally and at some length with some 224 different state legislators in six different states. I have a pretty good idea now of the make-up of a state legislator in a midwestern state.

State legislators, generally, have a sneaking feeling in the back of their brains that in some way educational efficiency could be promoted by means of educational television. They aren't quite sure how this can work, they know that something ought to be done about it, and they are intent on pushing it. There is evidence in the sorts of things that have been recited: appropriations of $1,750,000 in Kentucky; $1,500,000 in Tennessee; $500,000 in Alabama; $600,000 in Nebraska. When you think of these sorts of appropriations in Pennsylvania, in Maine and in a number of other places, all of a sudden it begins to become apparent that somewhere the legislator, the small town legislator because these are all rural legislatures, have become convinced that ETV is an answer to part of his problems. I think this is good; I think it should be encouraged. I don't know what gave them this idea. I think that we ought to do our best to reinforce that idea. I think that it would be well for college administrators, university administrators, state boards of educations, boards of regents to realize that this sort of thing is going on. I would also like to make some further remarks, but I will not about the attitude of the business community, even the labor groups which are also convinced that ETV can do something, not only about the quality but about the cost of education.

Some attitudes have got to be changed. Some attitudes are about to be changed. I think that we might as well get ready to take advantage of those changes.

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ETV DEVELOPMENTS IN THE UNITED STATES BY REGION

Western States

Ralph Steetle, Associate Dean and Director

Department of Educational Media, Oregon State System of Higher Education

Educational television, in all of its manifestations, continues to attract substantial attention in the Western region. In some states the financial ability to construct facilities has led to early station development, and the initial favorable results have caused additional stations to be constructed and the power and coverage of existing ones to be increased. In other states, developments are more limited. A rough catagorizing of the western states would place in a list of active operations, rapidly increasing in service, the following: Washington, Oregon, California, Arizona, Utah, New Mexico and Colorado. In each of these states stations are on the air and consideration is being given to the expansion of service.

Areas of lower levels of development would include the more sparsely populated states of Nevada, Idaho, Montana, Wyoming, Alaska and Hawaii. But even in these states, some degree of planning is underway looking toward the time when conditions will permit ETV implementation.

The Western Interstate Commission for Higher Education continues an active interest in the development of educational television in the West. With the support of foundation and federal grants, conferences and consultations have been used to encourage cooperative uses of educational television to expand educational opportunities for Western youth.

The visibility given to instructional television by such specialized meetings has stimulated continued consideration of ETV in the ongoing activities of WICHE.

The rugged country which separates the isolated population centers of Alaska has discouraged the use of the four VHF channels reserved for education in the nation's largest state. Interest in instruction by TV has been demonstrated by the University of Alaska and the Anchorage Community College through the provision of credit for courses telecast by commercial stations.

Arizona's ETV stations, KAET Phoenix, operated by the Arizona State University, and KUAT Tucson, licensed to the University of Arizona, together serve about 80% of the state's population. Currently, the University station at Tucson serves 2000 campus students with courses and 30,000 elementary and secondary pupils with a school program.

California's Television Advisory Committee is charged with creation of a plan for the effective state-wide use of ETV and with coordinating authority over requests for Federal ETV construction grants. Currently, requests for such funds have been filed by the San Jose Office of Education, the San Mateo Junior College and the Santa Barbara Educational Television Association. On the air are stations KQED, San Francisco, KVIE, Sacremento and KVCR, San Bernardino. The stations in San Francisco and Sacremento are interconnected, and they program classroom television for about 350,000 students. Stations are to be activated in Los Angeles, Eureka, Fresno, Redding, and other areas. Extensive closed circuit operations link schools in Anaheim, and in the near future, additional school populations will come within its coverage.

In Colorado, since 1956, Denver's KRMA has been providing service to schools and adults. A request is on file for a federal grant to expand station facilities. While no definite plan exists for coordinated development in the state, closed circuit at the University at Boulder, together with activation of channel 12 and Channel 8 at Pueblo, are in the discussion stage.

No stations are on the air in Hawaii. A plan to develop a network of three VHF and six UHF stations serving 95% of the school children and 90% of the adult population awaits action by the next legislature, having failed to pass in 1963.

Idaho also failed to get legislative approval for the start of a three-station plan to serve 80% of the state's population. The University of Idaho operates a closed circuit system and is an applicant for a television station at Moscow.

Studies of Montana educational needs that could be met by the use of television led the Montana ETV Committee to recommend a network of educational television stations. At this writing, limited support has delayed next steps.

Limited use of closed circuit television can be found at the University of Nevada. No stations are on the air.

Utah is rapidly building television facilities through expansion of existing stations and the development of new ones. Pioneer KUED, Salt Lake City, seeks federal support for a system of 18 translators to extend its school and adult services. Two stations in Ogden, and broadcast facilities in Provo and Logan, indicate the extent of Utah developments. Planned expansion will increase the size of the school audience served from 60,000 to 100,000 in a year from now.

Washington boasts five ETV stations, with additional ones planned for the future. Coverage of Seattle's KCTS is extended to many parts of the state by means of translators and community antenna systems. A State ETV Commission, appointed by the Governor and the State Superintendent of Public Instruction, serves to coordinate state-wide planning.

Albuquerque's KNME covers an area of eight thousand square miles, providing in-school programs for pupils at all grade levels. KNME plans expansion of its facilities, and the New Mexico State University plans a station at Hatch. Since 1960, New Mexico has had a State Commission working to extend TV throughout the state.

In Wyoming some 6000 school children take advantage of school programs from the neighboring Denver ETV station. Closed circuit television is used for observation purposes by the College of Education of the University of Wyoming. No state plans have evolved for the construction of stations.

In Oregon a two-station network connected to studios in three cities enables about 75% of the state's population to receive ETV services. The Educational Coordinating Council, representing the State Board of Higher Education and the State Borad of Education, is actively working to extend coverage of the network beyond the populous Willamette Valley to other areas of the state. Extensive use of instructional television has been made by the State System of Higher Education since 1957. School program development and utilization is increasing rapidly under the stimulus of the State Department of Education. Extensive community antenna pick-ups place the service far beyond its present coverage limits. Applications are on file for the expansion of both stations.

WHERE ARE THE TALENTS TO USE TELEVISION IN EDUCATION?

The successful television teacher needn't be a matinee idol nor a clown nor a ham nor the dramatic type. The talents to teach with television are coextensive with the talents possessed by the effective teacher.

Not all teachers will leap at a new thing, and teachers are not lining up at the door of the production studios. The ore must be mined. It isn't far below the surface. The good teacher can be intrigued by the potentials of television and succumb to the allure of the possibility of doing better that which he already does well.

Those teachers who have tried television will testify that the medium opened new vistas to them at the same time that it demanded more of them. Teaching with television and attempting to utilize the full capacities of the educational media as well as television is more difficult, but the results can be more satisfying to the teacher and produce a better result for the student.

On virtually every faculty there is the Pied Piper, if only the school will provide the pipe. The first and fundamental decision, to embark upon the use of television for instruction, isn't the teacher's decision ordinarily. The underlying economic and administrative adjustments belong to administrators, and those decisions are not alone equipment decisions. Involved, as well, is a commitment to the support which the television teacher must have in access to the other educational media, to assistance in planning, production and direction.

But the warning flags are up in other personnel aspects of educational television at this time. They do not signal disaster, as yet, for there remains time to avoid it.

There will be an increasing need for those who can carry on the technical requirements of educational television and the other educational media as well. One prophet predicts that there will emerge in the not-too-distant future the "educational technologist," trained on a sub-collegiate, technician level.

At the same time, he suggests, there must be an up-grading of the preparation of those who may be expected to administer, manage, plan, guide and direct the utilization of educational television, educational media centers or total-learning resource centers. These, no matter in what field their foundation studies may have been, will be prepared in an inter-disciplinary approach to educational communication. They will have substantial preparation in the psychology of learning as well as the arts of producing educational material for effective teaching.

These will be the people who will possess the vision and imagination with which to conceive the techniques and methods by which to assist the teacher in the planning, design, and execution of expert television teaching.

The full creative powers of the teaching profession remain one of the greatest assets of the nation, but they have not yet been fully capitalized.

CASE STUDY OF A TV TEACHER IN A SECONDARY SCHOOL

Miss Wanda B. Mitchell

Evanston Township High School, Evanston, Illinois

I'm very much concerned, and have been concerned, with Dr. Conant's account of the education of the American teacher, and I have been educated recently by three things. I'm going to tell you how being a television teacher has changed me.

I think three influences in my life, since I started teaching, have caused me to make more changes in the way I teach than anything else. One of these is my superintendent, with whom I have been teaching in three different states for 20 years. I say he has changed me, because he is always so far out ahead, so progressive, so challenging and such a slave driver that you have to keep up and make changes or you can't exist. A second thing that has changed me in the way I teach is team teaching. I do not think that any other concept in secondary education has changed the way I go about teaching more than knowing and participating in team teaching. A third thing is television. Now while some of you were getting your education on the GI Bill, I was teaching in Schenectady, New York. This was during the War, World War II.

Where ignorance "'tis bliss, 'tis folly to be wise." And in 1944, in a little speech magazine, I dared to write an article on television. Now I'm not stupid enough to read it to you now, but everything that I said there is true except what I said about make-up. And that is no longer true. Our high school in Schenectady in 1944 - and I was a speech teacher - and our assemblies and our plays were used by the General Electric Company engineer who would try to feed them out over the air to the 50 receivers in Schenectady. They called the people up on the phone and told them to try to get it, and we provided the program. I sat in the studio and watched and absorbed, just as I am doing here in this meeting, and then wrote an article for other drama teachers on how you direct a play for television. I knew all about it then, I want to read only the last paragraph, last sentence only.

"However, no director or student of acting who expects to continue in that field after the war can afford to ignore this medium of expression which challenges us to utilize all the possible effects of stage, screen and radio. Let us be ready to make the most of this instrument for education and entertainment." At which point I dropped out of the television picture, because I was too busy just doing my daily teaching job.

When I came to Evanston, I was thrust back into it again; and since 1954, I have either been on camera as an on-camera teacher or, what I laughingly call a producer-director, which means getting everybody else to do the things for the classroom teacher who is receiving the program. What have I learned as a teacher because of this experience?

Like Janus in Ulysses, I am a part of all that I have met, and it's a little bit difficult to distinguish which of these things were done to me by television. I think I can separate them enough to make them clear for you.

The first one is what I have learned about teen-age boys and girls. Now I am not trying to tell you anything about elementary school or college level people. What I have learned about teen-age boys and girls, I could document and anecdote. But I'm going to keep within my time limit to prove a woman can do it, and I'm just going to tell them to you.

"Mother, I want to do it myself" is more than just a commercial for a headache remedy, it is the attitude of teen-age boys and girls. They do not want somebody lecturing at them, doing things to them, ~~and sitting~~ while they sit there passively gobbling it up. Secondly, in spite of everything I learned in education courses in college about attention, teen-agers can do two things at once. They can be writing and doing a thousand other things and looking through a blonde head to a screen and still see what's going on and learn from it. This is possible; I hate to admit this but they can do two things at once.

Thirdly, they draw very sharp distinctions between lessons and programs, and whenever the teacher tries to compete with commercial entertainment programs, most of the time you're second-rate. You'd better stick to your own area.

The fourth thing I've learned about teen-age boys and girls in my television experiences is that they are completely unpredictable.

Second main point, if you're outlining: What have I learned about other teachers? First, they are completely unpredictable. Secondly, I have to work with them in all kinds of situations, you know, and I've learned they have very peculiar work habits, these other teachers. By peculiar, I mean queer, and by queer, I mean different from mine. They emphasize ideas in a peculiar way. Until I started working in television, I didn't know what other teachers did. I took education courses in college, and I made observations, but I didn't know then what I was seeing. Since then I have attended institute days and visited them in classes, but they're faked. I didn't know what really goes on in the classroom until television opened all the walls and I saw what went on other places.

In spite of the fact that these other teachers with whom I work are considering very unusual subject matter areas, because they're not mine, it's amazing how much they know and how much knowledge and skills the teachers of other subjects have. This is something I've learned because of television. I've also learned that every single one of them, and I've seen some very bad ones and some very good ones, can teach me something if I'm willing to learn. That's what I've learned about other teachers.

What have I learned about lesson planning? That's point three. I use lesson planning just because I don't know any other word. It's what the teacher does all the time with kids and the stuff. Now you can figure out some other word for it.

We teachers waste much time repeating, riding our hobbies, and satisfying our own desires to perform. When I have to cut it down to 20 minutes, and take out all the things I just enjoy saying, it can get down to 20 minutes. The next thing - I don't teach all day on television. I have other classes with no television involved in any way. And most non-televised lessons would not stand up under the scrutiny with which evaluators examine the televised lessons. Another thing I've learned about lessons and planning them is that what students see may be as important as what they hear, including the room, the teacher, other students and visual aids. I worried myself into a lather trying to keep from having an unbusy background on television and having everybody's attention focused this way and that and then walk into my regular classroom and pay no attention to this. It doesn't make sense.

Video taping with a playback is often followed by the burning not of the books, but of the lesson plans. If no video tape recorder is available, minutes kept by a class secretary will have the same salutary effect. I wish I had time to tell you three or four descriptions of this that have jarred me. I have a class secretary, a student, who gets up the next day and reads what happened the day before, with the minutes corrected by the class. And their description of what I thought I was doing is jarring, and I've learned this about planning my lessons. That which flows from the mouth of a teacher is only a small segment of the teaching-learning cycle. And in our television lessons in our school most of it is a teacher-centered thing, I'm sorry to say. With all of the testing and arguments and research, it's still difficult even to find out what you have really taught.

Next, what have I learned about the team. In every meeting I go to on utilization and anything connected with television there's a studio teacher, there's a classroom teacher and the team must work together. Now what have I learned about the team? I'm in a public high school so this is what I've learned. The chief administrator is the captain of the team, and he holds the key to the locker room. Number 2: the janitor, or the custodian, is also part of the team, and he can't be fired. The engineer and the director must be soul mates or there will be 15 yards penalty for unnecessary roughness. Parents should not always have to sit on the side lines. If there are still departments that believe television can add nothing to their academic efficiency and excellence, remember that the best defense is a good offense. The production crews carry the ball and no play, however well conceived, will score if they don't know where they're trying to take the ball. There are many competent, imaginative, and dedicated educators who are not in the classroom, they are on the television production staff.

The fifth thing I've learned is what we still need to learn. The first one of these is: how can we be sure what we ought to communicate through television? Edward R. Murrow recently said, "It is easy to send a message out thousands of miles, but the success or failure of the effort depends upon the ability to move the messages or communication the last three feet that separate one man from another."

So I, as a teacher of boys and girls, am terribly concerned about that distance between the front of the TV receiver and the boy or girl. The second thing we still need to learn, at least I do, is: what should we be communicating? what is the message? Does the fact that Telstar and similar satellites can now take what I teach and send it all over the world alter this? Does this change what I teach?

The third thing: what can educators, who have television as their medium, do to eradicate the hatred of man toward his fellowman, violence, moral laxity, irresponsibility? As a classroom teacher, I could handle many of the situations content-wise with boys and girls if some medium, or something, or somebody would handle these other things. As long as these questions remain unanswered, teachers who are concerned with the medium of television must continue to learn.

I'd like to join Robert Frost in a promise to continue the search for these answers. "The woods are lovely, dark and deep, but I have promises to keep. And there's miles to go before I sleep. And miles to go before I sleep."

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CASE STUDY OF A TEACHER ON THE COLLEGE LEVEL

David W. Bergstrom, Professor, Zoology & Physiology

Miami University, Oxford, Ohio

In 1955, Miami University, Oxford, Ohio, received an initial grant of $135,600 from the Fund for the Advancement of Education, followed by another grant of $150,000, to be utilized over a period of four years. This money was to be used for the purpose of studying the effectiveness of certain types of large group instruction, and to demonstrate the feasibility of these procedures at the college level. The study included a consideration of courses taught through television.

Since this is a case study, I should probably mention all facets of my relationship to the study, however, time will not permit this. Nevertheless, I will mention, candidly, as many as possible and allow you to make what you wish of them.

How did I land on TV? Walking down a hallway after a meeting, the Dean of Educational Services simply asked if I would be willing to give it a try. Said he, I was an "effective teacher", a "popular instructor", and "the subject ought to lend itself well to TV," a sure way to sell someone on the idea. Only an interested and adventuresome spirit caused me to say that I would give it a try. My department concurred. I had no real idea of what I was getting into.

I have stated many times, in many places, that not every teacher should go on TV. An animal shifting from its normal woodland environment to the grassland can survive successfully only if it can adapt to the new environmental factors. Not many can do this. So it is with teachers in a new environment. I moved into the new environment with only a few hours of advance planning, and orientation to the medium. The first month was horrible beyond description, both personally and academically. But slowly some adaptive features within me and within the other specimens of my new environment, began to emerge. Life became smoother, and functioning began to have a feeling of normalcy. I felt I could survive, and the new environment became interesting and challenging. I have watched others fail in ITV, primarily for lack of adaptive qualities. Somebody pointed the finger at the wrong person. Identification, selection and training remain a problem. It should also be said, that, even though I remain on the medium for another decade, I probably will never be as truly happy, or satisfied as in the conventional situation, for there are some features of the TV environment that cause me to adapt only with both mental and physical discomfort of some magnitude. Moreover, I am deeply conditioned to the conventional.

Why was my department almost eager for me to go on TV? The answer is simple. By departmental standards, I could do the job of five or six men. They could be freed to expand the curriculum while enjoying a reduction in contact hours. This was practical!! Over conventional methods, it is estimated by the Dean of the College of Arts & Sciences, I have saved the University approximately $31,000 per year in manpower costs, to say nothing of the fact that it may have been nearly impossible to hire appropriate top-notch staff during successive growth years to handle the increasing numbers of students.

Am I satisfied with the academic results via TV? Let me state that for three years I had classes being evaluated by professional evaluators against so-called control classes. In fact, evaluation of effectiveness was done student by student. Numerous criteria and evaluative devices were utilized. I could bore you with numerous impressive statistics, however they all add up to what you probably expect. I am a charter member of the cult of "no significant difference". I refer you to the Final Report of the Experimental Studies in Instructional Procedures, Miami University, Oxford, Ohio, 1960.

Actually, I personally have paid little attention to the findings of the professional evaluators. As a practitioner in higher education with reasonable experience, I have certain standards and aims with regard to what I expect of the students. If I saw that I was getting appropriate results by televized instruction, I felt I could be satisfied with the use of the medium. I must admit, however, that I have remained continually disturbed over the fact that I am unable to get *better* results through the use of this grand audio-visual device called ITV. I keep harboring the hunch that we (including the students) still don't really know how to use it. And where are the students when they take the course? Anyplace where there is an appropriate TV receiver. Leave 'em alone where they want to be and we get better results.

I will anticipate a question concerning my relationship with the crews, from engineers through floor men. In general, our relationships have been most cordial and delightful. Perhaps this has been because they have been more tolerant of me than I sometimes have been of them. Too, they have graciously accepted my oft-times blunt suggestions and criticisms. In general, I have felt that I am the only one allowed to make errors - I expect peak performance from them, and I've gotten it. Students will accept a "normal" boo-boo by the professor, but a technical error will cause them to be critical and/or laugh. They are, after all, conditioned to commercial TV. Also, I have emphatically made it known to the TV personnel from year to year that I expect the student to be able to see, and hear, whatever is being shown and said, preferably better than in the conventional situation. I have suggested to the director and camera men that it might be wise to have two words constantly flashing through their cerebrum: *think*, and *tight*. Once or twice, I've been called a prima donna, but the results on the screen have been generally up to my, and their, expectations, and we have had a right to be personally proud of the results.

After 6 years, and nearly 600 hours, on camera (many more if one were to count the video tape showings), can I see any compensations? Materially? Not too much, although a few extra dollars have probably been received for being a good boy on TV. A 50% reduction in teaching load has been looked upon by some of my colleagues as a form of compensation, but not by me. The rigors of ITV preparation, teaching, and general management are still little understood or appreciated by most collegiate personnel, either academic or administrative. Every dean, academic vice-president, and president ought to be required to give a full year credit course on TV. Only then will they *really* understand. A form of compensation, not often thought of as such, the single most important device in the studio, comes via the video-tape machine. Time is made available during the typical academic day to do desirable things other than repeated identical classroom performances. Of course, there has also been the intangible compensation of a good feeling that comes in a pioneering situation.

But after these several years of TV experience, I found myself harboring the feeling of being caught in a grind. Moreover, I found myself becoming complacent and unexcited in the job. It became tougher and tougher to work at changing the old run-down sheets, in spite of the fact that I was seldom satisfied with a tape or show. I, therefore, decided to take at least a year off - this year, '63-'64. At this point of the academic year, I am completely uncertain as to whether I shall return to the medium. If pressed in a later discussion period, I may choose to reveal reasons for a growing personal disenchantment with ITV. Preparations, the ground work, are being made by our Director of Broadcasting to have me tape a 90-hour Biology course, not only for local use, but also for distribution. At the moment, I am less than enthusiastic, at least with regard to the distribution. I am in favor of LOCAL PRODUCTION by LOCAL STAFF of ITV offerings. This is when success and happiness comes, along with acceptance of the medium as a mode of instruction.

At the present time, I can only suggest that I cherish my years of experience on TV. Unless something occurs to alter their present opinion, the academic administrators of my institution, particularly as expressed by the Arts & Science Dean, and the Dean of Academic Centers, are inclined to promote ITV among the various departments, and predict that its use will be substantially greater in the future.

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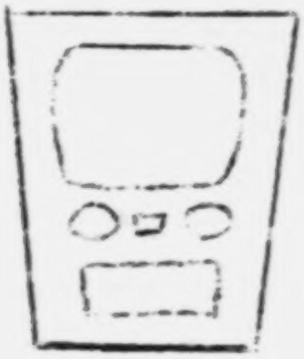
TRAINING TEACHERS IN THE NEW MEDIA

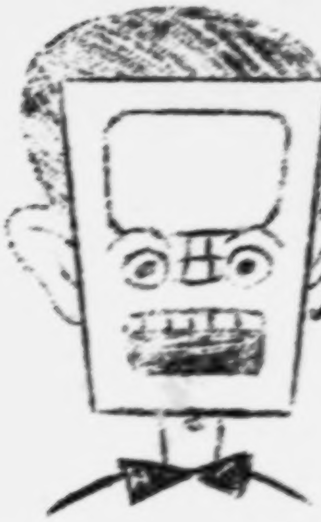
Herbert V. Hake, Director of Radio and Television

State College of Iowa, Cedar Falls, Iowa

At the last count, there were 1,209 colleges and universities approved for teacher education in this country.[1] Since this count was made in 1955, I am sure that several more colleges have been added to meet the ever-increasing need for teachers. In too many of them, the television receiver - one of the most significant teaching tools ever invented - is still regarded as an "idiot box".

Some of my colleagues refuse to have a TV set in their homes. They consider it to be a menace to their reading, to conversation and to the amenities of family life. Several professors I know are convinced that the person who sees any good in television has a hole in his head. Several others who have finally yielded to family pressure by purchasing a set justify their apostasy by declaring that they must, after all, keep "an open mind" on the subject.

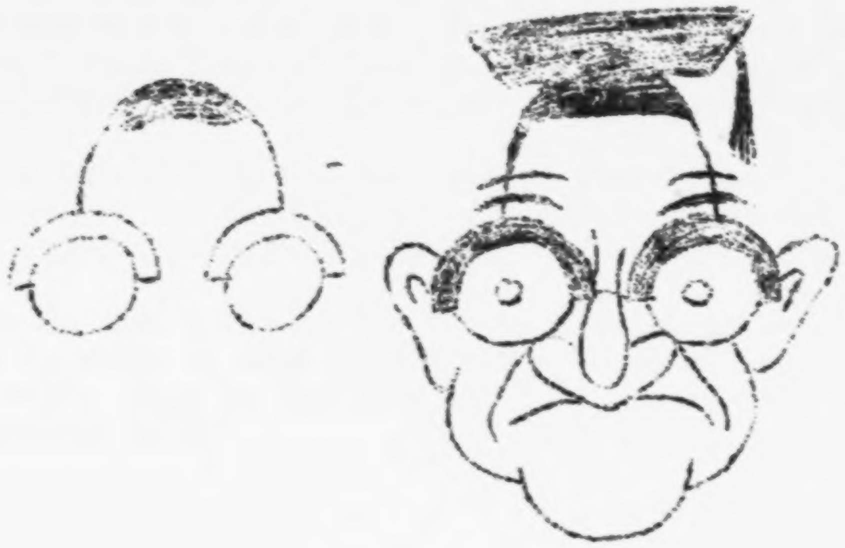




There is a curious paradox about this attitude toward television. In early December, the Board of Education of one of our large school systems in Iowa commended the TV industry for its "educational service" in reporting the full ramifications of our recent national tragedy and for giving the background and the qualifications of our new President. Yet this is the same school system which stands alone in refusing to participate in the educational service afforded by a TV Schooltime series that is being used by the schools in over one-half of the State.

Dr. DeAlton Partridge[2] has said that "when any system of communication becomes available to a large proportion of the population, it becomes a potential force in education. In the past, this has happened with the spoken word, the written word, printing, motion pictures, and radio. It is happening with television. If television is to play an important part in the education of the future; and if, as many believe, the role of the teacher is to be altered by this electronic device; then colleges and universities that prepare teachers must be concerned about it."

What has been the record of our teacher training institutions in the use of mass media? In general, we haven't achieved monumental success with radio. When I was a Freshman in a little college in Missouri, I was enthralled by my home-made crystal set and the clarity with which I could hear Station KSD in St.Louis. But it was a marvel which made little impression upon my professors. Even after radio achieved the technical refinement of the superheterodyne receiver, its use as a teaching tool was largely neglected. There were a few hardy souls like Dr. Walter Damrosch who recognized the possibilities of mass instruction, but our professional educators, for the most part, maintained business as usual and ignored radio as a teaching instrument.



How many colleges and universities do you know, right now, with a course for the training of teachers in the use of radio? I am not talking about professional courses for radio announcers, writers, producers, engineers and station managers. I am talking about courses designed specifically to show teachers how radio can be used as a medium for educational enrichment.

The average teacher in our schools today equates educational programming with insufferably dull papers delivered in a dreary monotone, paralyzing panel discussions, and counterfeit classroom demonstrations. It is no wonder that the words "educational radio" have acquired a stigma which many stations avoid like the plague. If the teacher training colleges in this country show as little interest in television as they have shown in radio, they ought to have their heads examined.

Quoting DeAlton Partridge[3] again: "To judge educational television primarily in terms of alleviating the teacher shortage or of enlarging classes is not valid." The valid question is: "Can TV bring better education; can it help children to learn more, to become more creative, to think better, to become better persons?" All of us here, today, believe that television can do all of these things. It certainly is not doing all of them now, but the failure is not due to the medium. It is due to the lack of imagination in the use of the medium.

And where does the responsibility for cultivating this imagination rest? It rests - at least in part - upon those who train our teachers. Why, then, isn't the job being done, except in a few isolated cases? There are two main excuses:

(1) "Our teaching candidates don't have the time to take courses in television." As academic requirements now stand, this is undoubtedly true. Let me give you an example of the courses required of a candidate for the degree of Bachelor of Arts who expects to receive a certificate to teach. This list is taken from the catalog of a teachers college which will remain anonymous:

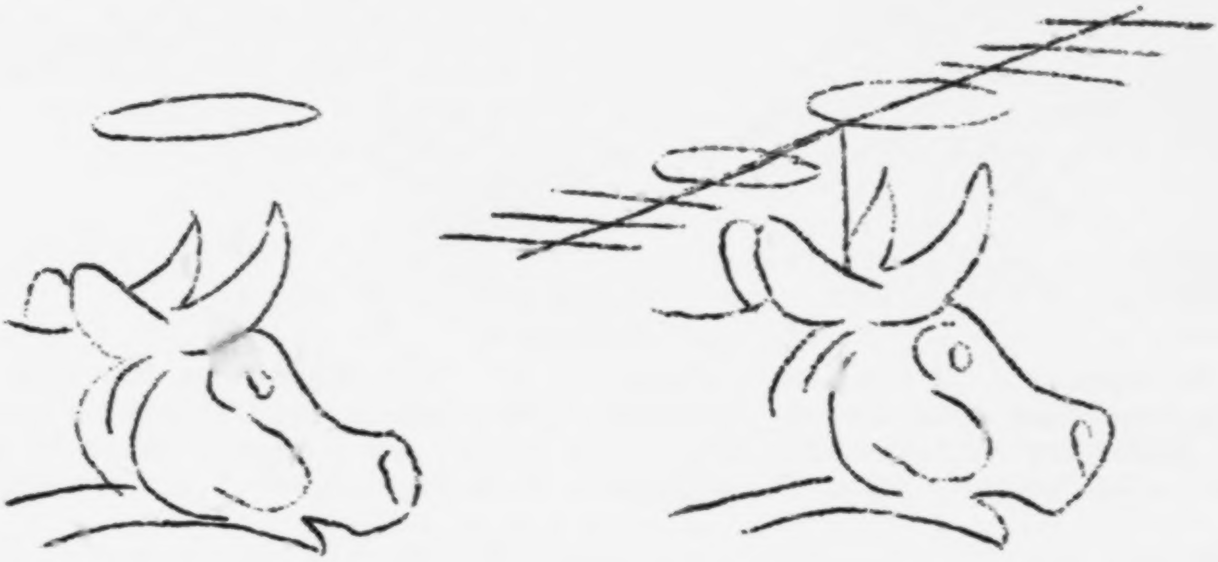
Courses in General Education... 43 semester hours

(These are courses such as "Man and Materials",
"Exploring Music". "Heritage of the Bible",
"World Resources", and so on.)

Next, there are the courses in the Common Professional Sequence, which total 22 semester hours. These include "The Teacher and the Child", Psychology of Learning", "Social Foundations of Education" and Student Teaching.

We now have a total of 65 semester hours, exactly one-half of the 130 semester hours required for graduation. All major, minor and elective courses (if any) must be crowded into the remaining 65 semester hours.

It occurs to me that a few of the sacred cows might be removed from the academic pasture in order to make room for the breed of animal that provides a higher grade of milk. This is the kind of cow I should like to recommend for every teachers college herd:

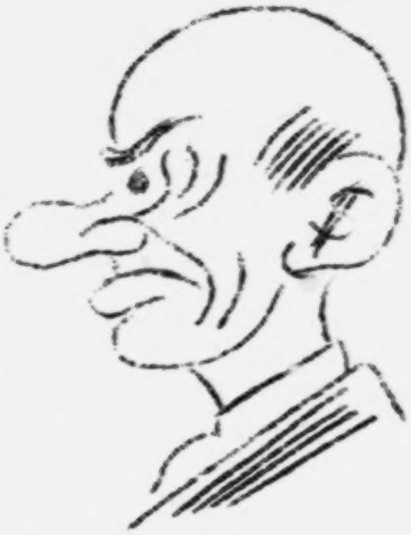


There is a second reason why this hybrid is not permitted to enter our Halls of Ivy: (2) "The college has no TV station of its own, so there is no laboratory for courses in television."

It is not necessary to have an on-the-air TV facility in order to teach courses in television. Closed-circuit TV equipment with vidicon cameras will serve the needs of a laboratory, and this type of equipment is within the financial means of most teacher training colleges. Moreover, commercial TV stations welcome public service programs that have visual excitement and community appeal. They are understandably reluctant to give valuable air time to the run-of-the-mill "educational" program in which there is neither communication nor conviction. But there is no lack of outlets for programs which have carefully prepared video values.

I find it difficult to join in the chorus of condemnation of commercial TV stations. Everyone surely recognizes the fact that in our American system of free enterprise it is necessary for the commercial station to sell advertising in order to meet its tremendous expense of operation and to make a reasonable profit. And yet, in a time of national crisis such as we experienced a few months ago, every commercial station in the United States instinctively sacrificed its advertising revenues for three and one-half days in the public interest. The dignified documentary which commercial television brought us should be remembered when next we are disposed to "decry the little box as an invention of the devil and the opiate of the masses."[4]

For even when commercial television is doing business as usual, it is not as bad as its critics paint it. This is the popular conception of the manager of a commercial station:



He is regarded as a "CASH-EAR" - a man who listens only to the sound of money and who is indifferent to the public interest, convenience and necessity. If you will stop for a moment and recall the many public services performed by your local commercial stations, you will recognize the unfairness of this view.

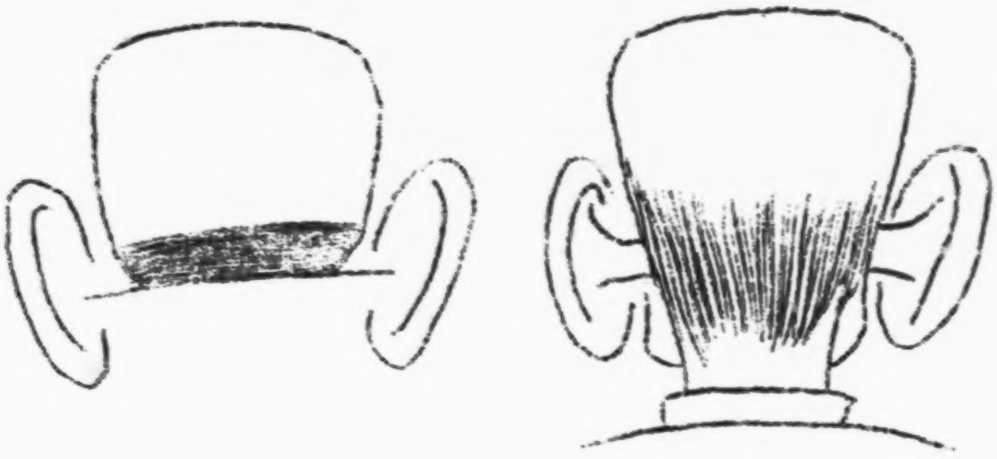
Moreover, most of the significant educational work that has been done in this country has been done by the despised commercial stations.

Dick Hull, who is probably the most widely-known pioneer in educational television in the world, blazed the trail when he put WOI-TV on the air nearly 14 years ago, on February 21, 1950. Although the station was owned by Iowa State University, it was (and continues to be) a commercial station. Since it received no financial support from the State of Iowa, it was obliged to pay its way from the outset. Despite these fiscal pressures, however, it has allocated large segments of its time through all these years to educational programming, in which the State College of Iowa has been privileged to share.

At the moment, three other commercial television stations in Iowa are carrying the Schooltime programs produced by the State College and the two State Universities. The stations have made time available at bargain rates, and the County Boards of Education have assessed the participating schools nominal per-pupil fees in order to meet the expense of broadcasting. Kinescope recordings of the programs originally produced for WOI-TV are furnished as a public service.

All of this convinces me, at least, that a teacher training college can find an effective outlet through a commercial TV station and that its work in the medium of television need not be handicapped by its lack of a TV station.

I believe that it is high time for us to stop making excuses and to leave the Horse and Buggy age.



Too many teachers of teachers are still looking backward to the comfortable days when life moved along at the leisurely rate of four miles an hour. Methods of transportation and communication have changed in the past fifty years, and we need to catch up.

If our future teachers are to make use of the marvelous medium of communication which we call Television, it is incumbent upon us to give them some guidance in adapting their teaching to it. For it will involve different methods of teaching than we learned when we were in college.

In 1962, the Subcommittee on Instructional Media of the American Association of Colleges for Teacher Education published an Outline of a Television Course for Teachers. I had the privilege of serving as a member of a subcommittee of that Subcommittee. To my knowledge, the course which we outlined is being used by only one school: Southern Connecticut State College in New Haven, Connecticut.

It may tax our ingenuity to build the kind of courses that will have practical value for our future teachers, but whether it requires special orientation courses for us, or a team-teaching effort, or the investment of a sizeable sum of money for laboratory facilities, or a combination of all three, it is an obligation to our students which we must meet.

Edwin P. Adkins, formerly Director of Education at the State University College of Education in Albany, New York, and National Coordinator of Continental Classroom, has pointed out that "television is not the panacea for all of the problems of education. It is doubtful that it will significantly alleviate the teacher shortage, the lack of dormitories or classrooms, or the dearth of instructional materials...Television cannot replace the classroom teacher, but it may help him do a better job."[5]

On the strength of this possibility, I earnestly hope that the 1,209 colleges and universities approved for teacher education in this country will face the future instead of the past.

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[1] Meek, Elizabeth Anne, "The TV Teacher", Teacher Education: the Decade Ahead, DeKalb Conference Report, National Education Association, Washington, D.C., 1955

[2] Partridge, DeAlton, Introduction, Television in Teacher Education, The American Association of Colleges for Teacher Education, Washington, D.C., 1960

[3] ibid.

[4] Pack, Harvey, "TV Keynotes", Waterloo Daily Courier, Waterloo, Iowa, December 3, 1963

[5] Adkins, Edwin P., "Implications of Continental Classroom for Education", Chapter 7, Television in Teacher Education, The American Association of Colleges for Teacher Education, Washington, D.C., 1960.

WHERE IS TV IN ITS OWN TECHNOLOGICAL EVOLUTION?

The man who decided to wait "until they perfect the darned thing," probably still is enjoying the thrills of Niagara Falls through the stereoscope. However, the prudent administrator must give some thought to the matter of when to invest in equipment for educational television, for, as one engineering consultant has observed, "modern television equipment is expensive; but so is obsolete equipment."

The technology of television has moved steadily ahead with occasional great, dramatic spurts in applied areas, such as the advent of the videotape recorder. Research and experimentation continues in highly refined realms beyond the ken of most of those who use or view television, and the prophets conjecture that a field which one of them has dubbed "intellectronics" will make a 100-fold change in educational effectiveness.

Despite the continuing emergence from the laboratories of marvels undreamed of, the educational administrator today can safely, with expert consulting help, put together an effective system or systems of television equipment to meet the educational needs which television may satisfy.

The systems can be broken down, for the convenience of the non-technical mind, into these categories: origination equipment, recording equipment, distribution equipment, and receiving equipment. Technical advances are being made steadily in each category.

At the originating end, the cameras still are of two basic kinds, the image orthicon and the vidicon. The image orthicon has been the major studio camera. It is more complex, larger and heavier, but it possesses some capabilities still not available in the vidicon camera. However, the vidicon, the work-horse for the odd jobs of television and for many industrial tasks has been greatly improved. A new vidicon tube known as the "Plumbicon" is currently emerging. It promises to reduce the higher light levels needed for the vidicon and to perform other wonders in improving both black and white and color television pictures.

Solid state physics contributes constantly to television technology. The transistor and the diode are making equipment more compact, reducing the heat factor, providing greater equipment stability and requiring less maintenance. Soon it is expected that much maintenance and repair may be accomplished with "plug-in-modules" in which entire circuits may simply be withdrawn and replaced on a plug-in basis

Despite the steady technological movement, the administrator or governing board may, with impunity, invest in a television system, with good engineering advice, and be assured of achieving completely satisfactory technical standards for educational television. He need not hesitate. The machinery is available, reliable and warranted to do the job. As the technology advances, results are improved and costs of operation are reduced. The administrator may experience some frustration, but the need for educational television is here now. The technology is up to the task.

Perhaps, the greatest frustration of educational television operation was alleviated with the advent of the videotape recorder. Early struggles with the kinescope, which recorded the television picture on film for later use, set many a director and engineer to jabbering. Then came the videotape recorder with an unbelievable impact, because it provided so many new capabilities. It can record. Immediate review is possible. The tape can be stored or distributed and replayed all with high technical quality - and the tape can be erased and re-used.

Videotape recorders are undergoing changes today which promise to reduce their cost while maintaining the quality of their recording. However, one large snag remains. Two different systems are being used for recording. One of these, the transverse scan system, has been pretty well standardized, and a tape recorded on one recorder may be played back with equal results on another employing the same system. The other system, helical scan, still remains unstandardized. Until a standardization is achieved, there is little assurance that a videotape recording on one of these machines can be played back on any other machine with the same result. The impact of the videotape recorder, still under continuing development, will echo through the studios for a long time. The new powers which it presents to educational television have been realized only in part to date.

The television distribution processes are, also, undergoing change and improvement. Old methods are being expanded, and newer methods are emerging. The expansion of broadcast television for education rests chiefly in decisions to be made by the Federal Communications Commission concerning a new Table of Channel Assignments. At present the FCC proposes a Table containing 2,634 assignments with 703 reserved for educational use. The National Association of Educational Broadcasters proposes an assignment of 3,214 channels with 1000 reserved for educational use. Education has a stake in these discussions.

In any event, an increase in reserved channels for education is bound to occur, mainly in the UHF (ultra high frequency) range. A UHF frequency has, in general, a shorter "critical distance" than does a VHF frequency, and a channel in the lower ranges of either VHF or UHF is generally more effective than a channel in the higher ranges of either category.

The educator today need not be nearly so chary of investment in a UHF station for several reasons. The technology of UHF is improving steadily, but, more importantly, all receiving sets produced after April 30, 1964, must be all-channel receivers. There is reason to believe that the conversion from VHF-only receivers (most receivers today) to all-channel receivers will proceed rapidly with the help of the persuasive salesmanship of the industry and the advent of new UHF stations of both the commercial and educational varieties.

The need for sharing and interchanging programs has required the development of methods for transferring television signals from one place to another, or from one station to another. Much of this is accomplished by micro-wave systems. This technology is advancing, also. Microwaves operate at frequencies higher than the UHF frequencies and shoot signals from one place to another on "pencil-like beams." They are used in numerous different situations in television, and they have a direct application in tying together stations in an educational network. Once tied together via microwave, networks can find many uses for the microwave system, for other information may be transmitted simultaneously with the television signals. The system may be used to carry other data from point to point to deliver administrative or research information or feed a computer from a distance.

An educational institution or school system considering a microwave system clearly needs consulting assistance. There are numerous combinations of microwave systems, and the availability of commercial microwave service for lease introduces additional considerations relative to comparative costs between ownership and leasing arrangements.

The fastest growing distribution systems are the closed circuit systems. These carry the signals by coaxial cable, for the most part. Education is making use of these in many ways - within a single classroom, to interconnect buildings to tie campuses together, or to collect many high schools and colleges on a network as has been done in South Carolina. Still another system, which also has application to educational situations, is the CATV (Community Antenna TV) in which weak signals from distant stations are strengthened and redistributed via cable to subscribing receivers. Often when a CATV system is installed in a community, a local educational channel will be added free of charge, thus providing a closed circuit educational service programmed locally or providing programs from a distant ETV station.

The airborne system of distribution is proving itself now and is seeking greater capability through the allocation of additional channels and supplementation from ground-based translator stations.

Still another distribution system has been made available by the FCC. It is known as the 2500 megacycle Instructional Television Fixed Service. It is available for educational use. It will operate as a broadcast system, which must be licensed, but it will operate much as a private closed circuit system. The new ITFS, for which equipment has not yet been produced, allows the transmission of television signals from one place to another on a line-of-sight basis to receivers pre-tuned to that specific channel. It employs a low power transmitter. Such a system could employ five channels over which five different programs could be transmitted at the same time to several different places within a range of about 15 miles. In addition, the transmitter may be unmanned, thus reducing operating costs.

Again, the educator has before him reliable systems with high performance standards now commonly in use and fully capable of accomplishing the origination, recording, distribution, and receiving of educational television.

In addition, there are some new developments ready for experimentation and use. And, then, there are possibilities on the horizon of unbelievable promise. The earth orbiting satellites provide every possibility for global television service illustrated best by the fact that the solemn funeral ceremonies for the late President John F. Kennedy were relayed, via satellite, to 23 countries and a total population of 600 million people, the greatest potential audience for any event in all time.

Based on different physical principles and working at levels 20,000 times higher in frequency than the 50,000 megacycle upper-limits of radio radiation is the LASER (Light Amplification by Stimulated Emission of Radiation). In brief, the LASER may make possible the simultaneous relay of as many as a thousand television signals over long distances on a single light beam.

EDUCATIONAL TELEVISION TECHNOLOGY

BROADCAST AND OTHER DISTRIBUTION SYSTEMS

Oscar Reed, Jr., Head
Jansky & Bailey Broadcast-Television Division
Atlantic Research Corporation
Washington, D. C.

In its Golden Anniversary issue in May 1962, the Proceedings of the Institute of Radio Engineers carried a Section entitled - "The Future - Communications and Electronics - 2012 A.D." Approximately 60 outstanding radio engineers and scientists endeavored to project themselves 50 years into the future and write a paper on the developments of the "past" 50 years. Many of these papers center in communications, man-machine coupling, and the field of education. "Education in 2012 for Communications and Electronics" by Terman, "Engineering Education - Circa 2012 A.D." by Everitt, "A Day in the Life of a Student in the Year 2012 A.D by Ponte, and "Fifty Years of Teaching Machines" by Zahl are but a few. To set our technology in perspective, these papers would suggest that were educators to make appropriate use of all the following elements they might begin to approach the dreams reached for in this 50th anniversary issue.

ETV broadcast stations (UHF-VHF), ETV networks, microwave systems, CCTV systems and CATV systems, air-borne, satellite transmissions, the 2500 Megacycle Instructional Television Fixed Service, and LASER transmissions might all contribute in varying degrees to bringing about the day suggested by two additional authors in this same issue. Simon Ramo[1] points out that we are all aware of the enormous impact of science and technology in shaping our future lives usually illustrated by H-bomb and space achievement references. In the long run, however, he postulates an area of technological endeavor of even greater significance. He says it is, the extending of man's intellect, the source, itself, of all future scientific and social progress. He views the extension of human intellect by electronics, which he calls "Intellectronics" - into every aspect of running our businesses, our educational systems, our government, - wherever intellectual processes are involved. The most truly intellectual activity of all he visualizes as the education of the human brain. An "Intellectronics" system could, he believes, make a hundredfold change in educational effectiveness.

- Routine material can be machine presented, leaving the more difficult concepts for the higher intellects of the human educator.
- Programmed machines can stimulate thinking of the student.
- The electronic "presenter" can speed up or slow down, add more explanations, skip steps, as it makes the presentation - Automatically as the result of continually noting the students' pushbutton response to questions.
- An intellectronic system can remember the progress of millions of students. It can compare their tested learning with the estimate, with the plan.
- It can measure and report deviations.
- It can recognize an individual student and can give him an accelerated or special presentation or test, - all by a virtually instantaneous scan of his record and a following of rules that have been set in by the wiser human educator.

John R. Pierce[2] in four succinct paragraphs relates travel to waste and points to communication as an alternative to travel. Surely, he says, one need not move human bodies in order to achieve a meeting of minds. The broadband circuits of the future can provide face-to-face, or group-to-group sound and vision, packaged to preclude eavesdropping. He points out that when communication is cheap, enough students can attend classes by television and, surely we see this in existence in considerable degree today. Dr. Pierce concludes that one would not care to visit his wife by television, but the clear answer here is that the man could stay home and communicate to work! Now that this has all been foreseen, and surely many of you here have had a clear hand in inspiring some of this dreaming by your own pioneering efforts, where do we find ourselves at the threshold of 1964 with respect to this wide array of technological tools? Before parting with these first references, however, and lest they seem a little routine to you, let me refer you for further stimulation to the paper by Harold A. Zahl[3] relating to the last theoretical piece of work, the Unified Computer Field Theory which was first proposed by ILLIAC IV (a computer) at the University of Illinois in 1996. This led to the well-known Nobel prize committee decision eliminating all future machine contributions from competition with humans.

I. BROADCASTING (UHF - VHF)

Television stations operate on VHF and UHF frequencies and are assigned three bands of frequencies which are divided into six Mc channels. The frequency ranges are 54-88 Mc (except 72-76 Mc), 174-216 Mc, both VHF ranges and 470-890 Mc in the UHF range. A total of 646 stations is now operating of which 531 utilize VHF channels and 115 occupy UHF channels. This number includes 83 noncommercial educational stations of which 29 operate in the UHF portion of the range. There are 23 educational construction permits outstanding, four of which are for VHF and 19 for UHF facilities. Availability of channels is determined by a Table of Assignments contained in the Rules of the Federal Communications Commission listing the various cities and towns. The table lists approximately 2200 channels of which about 350 are presently reserved for noncommercial educational television use.

There are about 117 construction permits outstanding which represent uncompleted construction or stations which have been on and gone off the air reverting to construction permit (CP) status for economic problem reasons. Many of the latter represent UHF facilities whose coverage has not measured up to that available to VHF facilities, which in many cases are assigned in the same market area. Thus with only 12 channels available for assignment in the VHF portion of the spectrum and 70 channels, many of which are unused in the UHF region, the Commission has been faced for some years with an allocation problem by reason of coverage and other technical inequities.[4]

(1) In January, 1960, a new Notice of Proposed Rule-Making was issued by the Federal Communications Commission identified as Docket No. 13340. The Commission therein invited comment on its proposal to:

(a) Consider applications for waivers of minimum television station separation in exceptional, individual cases meeting certain criteria; and

(b) Adopt revised rules and standards governing calculations of the service areas of television broadcast stations.

A new Table of Assignments issued by the Federal Communications Commission in late October 1963, in a further Notice in Docket No. 14,229 proposes a total of 2,634 VHF and UHF assignments of which 703 would be proposed to be reserved for educational use. In a report entitled, "UHF Television Channel Assignment

Plan"[5], NAEB has submitted a study using digital computer methods which suggests a table having 3,214 total assignments of which about 1,000 would be reserved for educational use.[6] In selecting the 1596 communities for which channel studies were made by computer means, leaving untouched existing stations and issued construction permits, the 1961-1962 national survey undertaken by NAEB was used extensively as a guide.[7] This compilation indicated a projected ten-year need for 1,197 channels. The nationwide uses of educational stations of all classes and types in use at present are listed alphabetically by state and city in the document prepared by Gertrude G. Broderick.[8]

The average service ranges which television broadcast stations can deliver have been studied and were reported in the findings of the Television Allocations Study Organization to the Federal Communications Commission in 1959.[9] While receivers have improved to some extent in the meantime, the advent of the all-channel receiver as standard in 1964 may bring some further upgrading. The "critical distance" factor of range will be with us for some time however. This is especially true where terrain or man-made propagation path roughness is considerable.

Frequency Range	Channel Range	Critical Distance-Miles
Low VHF	2-6	65
High VHF	7-13	55
Low UHF	14-40	40
Medium High UHF	41-83	30

In no case does services cease suddenly as the "critical distance" is exceeded. Rather, at about this distance the proportion of viewers receiving really satisfactory pictures begins to decrease rather rapidly, while those receiving poorer pictures increases correspondingly. Better than average receiving antenna installations, especially for school installations, may be expected to improve these average ranges also. Thus, reasonably wide-area coverage, usually about a major population hub, with service to a large general viewing audience as well as school viewers may be expected to be provided by this type of facility.

Satellite and booster stations, which may operate simply rebroadcasting the program material of the main station, may also be used. Thus, the range of one broadcast outlet may be reinforced or made available in an additional area.[4]

The number of channels needed for the educational service is directly related to these broadcast service ranges and supplemental station possibilities. Thus, we see that Alabama has 16 channels reserved for educational use in the present FCC Table of Assignments. Florida has 22 channels so reserved.[10] These states as a result of specific requests and far reaching planning are in the vanguard, and it is surely not hard to envision the ETV channel growth needs prophesied in the NAEB studies.

II ETV NETWORKS

As educational television stations come into operation in any given region, it is natural and efficient that there should be course and program material interchange between them. The Federal Communications Commission provides for this by allowing educational stations to interconnect with microwave relay facilities between station locations utilizing several of the microwave frequency bands in the 2,000, 6,000, and 13,000 megacycle portions of the spectrum. On frequencies several times higher than the highest UHF channel, 884 to 890 megacycles, wavelengths are even shorter and can be beamed several tens of miles with "dish" antennas having high gain and pencil beam-like directivity. Thus, to some extent, frequencies in these bands can be used in multiples for receiving and retransmitting in several path "hops" if need be to reach over longer distances.

While such bands have been used in some states such as Alabama, California, Florida, Ohio, Oklahoma, Oregon, Texas, and Washington for such interconnection of several stations, newer standards and wider bandwidths need to be provided by the Federal Communications Commission for additional and longer system usage. The equipments commonly employed, to date, have been those developed for one-hop interconnection of studio facilities in a city to a remotely located single transmitter location. Longer haul, wider bandwidth, "heterodyne" equipment capable of multihop use can now be provided which will make intrastate and interstate networks practical should one state or several states desire to build their own systems.

Alternatively, common-carrier systems of AT&T, Bell, or private telephone companies can be leased to provide such interconnection for a monthly fee. The Bell system provides thousands of miles of intercity television channels. While some channels are used for educational systems and others are occasionally used for closed-circuit applications, most of the channel usage, at present, is by commercial network broadcasters.[11] At the start of 1963 there were 94,000 miles of video intercity channels on about 27,000 miles of intercity routes. Over 98 per cent of the channel mileage is on microwave radio systems providing at least four-megacycle bandwidth. By contrast in 1954, 30 per cent of the intercity 69,000 channel-miles was coaxial cable interconnection limited to 2.7 megacycle video bandwidth.

AT&T equipment operates in the 4,000 megacycle band with the backbone of its system being 0.5 watt, Type TD-2 equipment. For 1965, a 5-watt, TD-3 equipment is projected. Educators, particularly those associated with colleges and state departments of government have become very gregarious in their requirements. Frequently, they want video (television) information exchange, an audio channel for TV audio, and FM audio channel, an order or service audio channel, perhaps a teletype channel, and then even occasionally some data channels thrown in for interuniversity or computer center use. Where cost and operating expense comparisons may lie, between common-carrier leased rates (if the Federal Communications Commission has a regulation to cover the case) and a privately owned and operated system, may take several consultants to figure out. This necessitates a "systems" study.

All in all, educational television networking has made considerable progress since its feasibility was intensively examined at a conference in 1959.[12] More progress at a higher rate of implementation may be expected in the near future. In addition to the states previously mentioned, there is a Maine-New Hampshire-Boston, Massachusetts network functioning, and the educational television stations in Boston and New York City have been interconnected using common-carrier facilities. Kentucky, New Hampshire, and Nebraska are currently in the process of final designs to implement state-wide networks authorized by their respective state legislatures.

III MICROWAVE SYSTEMS

Part 4, Subpart F of the Rules of the Federal Communications Commission[13] deals with Television pickup, Television Studio to Transmitter Link, and Television Intercity Relay matters. All these auxiliary services may be thought of as necessary to do one of the following:

1. Transmit a TV program from a point remotely located from the TV studio to the TV station (as from a fire or football game). A "land mobile station" is the classification accorded by the Federal Communications Commission.

2. Transmit a TV program from a studio to the transmitter site. This is known in abbreviated terms as an STL station (studio-transmitter link).

3. Transmit TV programs intercity from one station to another (an intercity link).

In each of these cases related communications may also be included meaning accompanying audio and order or service voice channels can be put on the same "carrier" as the picture information or carried separately. Frequencies in three bands are available for these uses.

Band A - 10 channels, 16-17 Mc/s wide, between 1,990 and 2,500 Mc/s (not continuous).

Band B - 10 channels, 25 Mc/s wide, between 6,875 and 7,125 Mc/s (continuous). Top three reserved for common-carrier use.

Band C - Band C was deleted - Band D is still called "D"

Band D - 22 channels, 25 Mc/s wide, between 12,700 and 13,250 Mc/s (continuous)

Certain frequencies in the bands 17,700 - 19,300 Mc/s, 19,400 - 19,700 Mc/s, 27,525 - 31,300 Mc/s, and 38,600 - 40,000 Mc/s are also available for assignment on a case-to-case basis for the three classes of service although equipment is not generally available as yet and bandwidth and frequency tolerance are to be specified in individual authorizations. Sharing with other services is necessary on some of the frequencies involved and the noninterference provisions of the Rules may be invoked by the Commission if occasion demands.

Rule-making was requested of the Federal Communications Commission to provide for the transmission of closed-circuit television course material over such channels. This would provide for an extension of service between schools and colleges which might not have broadcast facilities yet might desire to contribute to a state or regional network activity involving both open and closed circuit types of operation. At the present time, there is no clear-cut provision for ETV microwave. If the ETV user is a broadcaster, he may operate on microwave frequency channels available to any broadcaster under the Rules governing studio-to-transmitter links and intercity relay. If he is not a broadcaster, he may apply for different channels provided under the Business Service Rules of Part 11 governing the Industrial Services. Educational groups are eligible under these rules, and some special provisions are made for closed-circuit TV operation at 6,000 megacycles by educators. It is significant that those operating under these Rules cannot use their facilities for transmission of material that is to be broadcast.

At Ohio State from 1957 through 1961, instructional television enrollment for WOSU-TV increased from 574 to 59,080 students (see Reference 7, pp 26-27). More recently, a branch of Ohio State located in Dayton has been taking 26 hours per week by microwave common-carrier interconnection from the main campus at Columbus. The opportunities and needs to bring the classroom to the student rather than the continuation of the classical pattern can be facilitated by "talk-back" arrangements through several technological advances.[14]

Microwave techniques may, therefore, be viewed as affording the opportunity under certain conditions to extend broadcast station or closed circuit courses into a larger combined zoning or state-wide pattern as occasion might demand. Similarly, as state departments of government are eligible under microwave Rules to service certain functions of their operations, common interest with educators may be found in joint development of microwave interconnection patterns and usage looking toward either private or common-carrier means.[15] Standards remain to be fully developed and defined in this whole area involving television and service transmissions of all types. NAEB in a study soon to be released under the auspices of the U.S.Office of Education is again in the forefront with a pilot study.[16]

IV CCTV SYSTEMS - CATV SYSTEMS

Closed Circuit Television systems and Community Antenna Television Systems share a common technical feature in that picture and sound signals are conveyed by wire transmission lines or coaxial cable to the viewers television set. For the former system generally no space propagation paths at all are concerned. In the latter mode, master receiving antennas focused on a distant broadcast transmitter are used to render very weak signals, generally inadequate for mass direct reception, usable for a large number of receivers which may be connected through signal amplifiers to the master receiving antenna system. The latter systems have become important adjuncts to educational television in numerous cases since the CATV entrepreneurs have shown a ready willingness to distribute ETV courses originated by educational facilities over their wired system to their individual subscribers. Generally, these programs and courses have been treated as a bonus feature further justifying the typical $125.00 installation charge and $5.00 monthly fee charged to individual subscribers. Thus, a choice of several commercial network programs and educational fare are purveyed for a fee although the latter type program is provided "free".

In a national survey undertaken in 1958 by the Joint Council on Educational Television,[17] 133 closed-circuit systems were reported in use by 119 educational institutions involving primary, secondary, and college levels. Some institutions that use broadcast television also have a closed-circuit installation or have plans for closed-circuit television installation.[7] In 1962, 96 colleges and universities reported closed-circuit use and 162 institutions reported plans underway for such instructional television.

A six-channel CCTV system has been operating in Hagerstown, Maryland, serving 46 Washington County schools for over six years. Originally financed from foundation funding and with the assistance of various manufacturers and the Chesapeake and Potomac Telephone Company of Maryland, this system currently involves five production studios and over 30 teaching specialists who develop and present a tremendous range of primary and secondary school course material.[18] Another notable use of this technique has been in the "Chelsea Project" in PS33 and the surrounding neighborhood in New York City.[19]

Notable uses of CCTV exist at several major universities in the nation. The use of this medium for specialized professional training has found ready acceptance in the School of Dentistry at Ohio State and other extensive uses of medical television could be recounted. Privately owned and common carrier cable interconnection has been used. In 1961 the Michigan Bell Telephone Company developed "round robin" closed-circuit educational television facilities at Michigan State University. In a continuous-loop hookup, the system is arranged so that originations may be made at any building location on the round robin thus permitting flexibility to meet the requirements of the University.[20] The armed forces have also made extensive use of CCTV for training purposes and some of these uses were reported extensively following the Third Armed Forces Television Conference held at Fort Lee, Virginia, in October 1962. The most recent conference held at Lowery Air Force Base in Denver, Colorado, in the fall of 1963 is reported to have drawn over 500 registrants.

Perhaps the largest of the CCTV systems in use today is to be found in South Carolina. In January 1963 the system encompassed 155 public high schools, four private colleges, four state colleges and the University of South Carolina and five Extension Centers. In five years appropriations were multiplied twenty-fold from $60,000 to $1,295,000. Southern Bell Telephone and Telegraph Company, Columbia, South Carolina provides the interconnection facilities comprising an extensive cable and amplifier system network.[21]

CCTV and CATV wired into schools, colleges, and homes across the nation can provide a programmed and scheduled approach to learning. Through CATV sources many citizens have been able to observe at close range the educational fare being provided for their children. There are several hundred CATV systems now in existence in many states of the nation and the subscriber audience has been estimated to be about five million.[22]

V AIRBORNE TELEVISION

The Midwest Program on Airborne Television Instruction (MPATI) started its first full academic year of the airborne program in September 1961. From a modified DC-6 aircraft flying figure eight patterns four miles above Montpelier, Indiana, program material is radiated simultaneously on Channels 72 and 76 to schools and classrooms generally within a 200 mile radius. Tape recorded school course material is used in the aircraft to feed two transmitters, thus the airplane can beam history to high schools while sending music to the grade schools.

If midwesterners desire, the airborne transmitters eventually may broadcast six courses at a time and a request has been filed with the Federal Communications Commission for use of Channels 72, 74, 76, 78, 80, and 82.

The television signals are broadcast by means of a 24 foot long retractable transmitting antenna that is lowered straight down from the underside of the aircraft once in flight and stabilized to maintain a vertical position. One plane is maintained on standby status while the other flies during the program day. Each has a six man crew, three flight crew members, and three television technicians. A typical school receiving the programs uses two UHF receivers or converters fed from individual antennas. Frequently, the program material is converted to a VHF channel for internal school distribution if a closed-circuit system for general reception exists at the school. A school 50 to 100 miles from the aircraft, installing receiving sets in five classrooms plus the outside receiving antenna and related parts of the distribution system, can expect to pay approximately $500 per room.[23]

Problems associated with the reception of sufficient direct to school signal from the airborne transmitter in larger metropolitan areas such as Cleveland, Chicago, and Detroit, due to line of sight difficulties have led to the request for supplementary translator facilities in these cities. Translators operate on UHF frequencies covered by Channels 70 to 83, and they are used normally to provide a receivable signal beyond the range of the main station, which they pick up with special receiving equipment and reradiate. There is some indication also that difficulty is experienced directly beneath the hovering zone of the aircraft and that supplemental techniques may be necessary in this case also.

The following annotation from the MPATI petition for Rule Making filed with the Federal Communications Commission in January 1963 is of interest.[24]

> "The evidence began to come in by the late fall of 1961 from the 2,000 odd schools and colleges in the six state region which were making some classroom use of the instructional materials. Most of these schools were receiving the UHF signals direct from the airborne transmitters over equipment especially installed for the purpose. Several hundred other schools in the greater Chicago area received about half the courses over their VHF receivers via rebroadcasts from WTTW - an ETV station in Chicago. Similarly, Columbus, Ohio, some schools that wished to use one of the courses at a time different from that scheduled from the aircraft did so via rebroadcasts from the educational station WOSU-TV. With this widespread usage forming the testing ground, MPATI was able to assess the effects as follows..."

In the engineering exhibit accompanying the petition for proposed Rule Making[25] it is proposed that the experimental operation engaged in to date be converted to a regularly licensed operation and that a regular airborne service be established which would provide six educational services simultaneously. The use of six channels near the upper end of the UHF television broadcasting band was proposed and operation with 100 kilowatts visual and 10 kilowatts aural effective radiated power would be used. The aircraft would fly a 10 mile radius orbit circle over Montpelier, Indiana. New propagation curves for signal coverage estimates are proposed and certain of the FCC channel assignment "taboos" are viewed as unnecessary.

Westinghouse Electric Corporation, Air Arm Division, Baltimore, Maryland, has issued an extensive report dated July 31, 1963, dealing with educational television distribution by various methods including airborne.[26] Certain cost estimates contained therein were prepared by A. D. Ring and Associates, Consulting Engineers, Washington, D. C. Availability and conservation of frequency spectrum matters were considered, among other things, in relation to a possible nationwide airborne operation. It was pointed out that under certain assumptions Channels 66 through 83 (18 channels) would provide six program educational coverage of the country, leaving Channels 14 through 65 (52 channels) for nationwide coverage for services other than educational or for supplemental educational service.

The Federal Communications Commission has directed that those parties wishing to file comments in the Airborne Rule Making proceeding may do so by January 3, 1964. Reply comments will be accepted until February 3, 1964.

VI. THE 2,500 MEGACYCLE INSTRUCTIONAL TELEVISION FIXED SERVICE

Excerpts from the F.C.C. decision in July, August, 1963 establishing this multichannel ETV distribution service give an excellent guide to its intended use.

"1. On July 25, 1962, the Commission adopted a notice of proposed rule making in the above entitled matter, to meet the needs of educators for the transmission of visual and aural instructional material to students enrolled in courses of formal instruction. While it would be possible to receive the transmissions of the stations which would be authorized under the proposed rules in homes or other individual receiving locations, the most important function of the new service would be to reach groups of students assembled in classrooms or other similar places for the specific purpose of using the instructional material so transmitted. Therefore, the transmission from stations licensed in this service would be directed primarily to specific locations selected in advance by the licensee and equipped with suitable receivers by the licensee. While it may be technically feasible to conduct the operation on broadcast channels the success of the operations does not require the use of broadcast channels.

"2. As a matter of fact, there are certain advantages in conducting this type of operation on non-broadcast channels. Most instructional TV systems will require more than one channel so that teaching material in several subjects may be transmitted simultaneously. Multichannel assignments which are not available in most places on broadcast channels can be made in non-broadcast bands. By avoiding this unnecessary use of educational broadcast channels they are left available for the transmission of cultural and educational programs designed for reception by the general public on receivers located in individual homes. Transmitter power in many cases can be used more efficiently because it may be concentrated in the directions of the selected receiving locations. Broadcasting is inherently wasteful of power because it must cover a wide area whether or not its signals are actually used by everyone in the area and it must provide a strong signal so that average home receiving installations which are not the most efficient will obtain reception. The ability to use power efficiently in a non-broadcast type of operation will permit the use of lower powered transmitters which cost less to buy and operate. While we have no specific data on the cost of receivers-converters for use in these bands, it is quite likely that they will cost more than similar UHF broadcast converters, perhaps twice as much. This may offset the saving in transmitter costs. However, when these receiver-converters are manufactured in quantity, the cost is likely to come down. Use of non-broadcast channels also provides a degree of privacy to the system because the average home will not be equipped with the special receiving apparatus needed to receive signals outside of regular TV broadcast bands and classification of the service brings it under the protection of section 605 of the Communications Act which is concerned with the unauthorized use of non-broadcast communications. The greater availability of channels in non-broadcast bands will provide for more independent systems wherein the selection and scheduling of instructional material can be tailored to the needs of the licensee." 27

Other quotations from this Order are of interest as they relate to the new type of operation and they are excerpted below:

"7. Although there is no suitable equipment currently available for operation in the 2500-2690 Mc/s band, several potential manufacturers stated that such equipment could be developed and indicated that they would pursue such development if the service were placed in the upper band."

"21. The Commission made it abundantly clear in the notice of proposed rule making that the proposed new service was intended to supplement the educational television broadcast service and not to replace it. However, several parties suggested that we call the new service "Instructional Television Fixed Service" to avoid any confusion with the Educational Television Broadcast Service. Since the proposed term more accurately describes the principal function of the new service we are adopting the suggestion."

"32. Section 4.935 relates to the amount of power that will be authorized. The use of excessive power creates an unwarranted interference hazard. The amount of power needed will vary from case to case. Applicants are expected to take advantage of all techniques which will provide as much signal as they need at all receiving locations in their system and at the same time avoid the radiation of excessive power in directions where no service is intended or far beyond the most distant receiver intended to be served. Ten watts of power out of the transmitter is considered to be a nominal amount of power and no special justification is needed for transmitter powers up to that amount. While the rules do not prohibit the use of higher transmitter powers we will examine such requests more critically to determine if the power requested is actually justified. That is why the rules adopted herein require a special showing where transmitter output of more than 10 watts is proposed."

"50. Section 4.984 is concerned with retransmission of signals received from other stations. The provisions of section 605 of the Communications Act of 1934, as amended, prohibit the unauthorized publication or use of communications received by anyone from any station other than broad-

> casting or amateur stations. The rule adopted herein will permit the retransmission of programs received from broadcasting stations, or any other class of station including other stations in the new service, with the consent of the originating station."

Six groups of frequencies are set aside in the 2,500 to 2,690 Mc/s band and generally a licensee will normally be limited to not more than five channels selected from one of the groups for use in a given area. The frequency groups are so divided in the spectrum such that the spacing between adjacent channels in any one system will be 30 megacycles. Remote control of the new facilities will be permitted. Thus, educators now have a flexible new tool to meet the needs for their multichannel course distribution systems.

VII. SATELLITE SYSTEMS

Telstar, built by AT&T, the first privately owned satellite, was launched July 10, 1962, by the National Aeronautics and Space Administration for a launching fee of $3,000,000. The orbit varied from 600 to 3,500 miles out into space. The equipment carried successfully received signals from ground stations on about 7,000 megacycles and retransmitted them back to earth using a transmitter power of about two watts and operating in the 4,000 megacycle range. Live television programs were exchanged this same day between the United States and the European Continent in England and France.[28]

Some of the technical factors affecting possible utilization of satellite communications for educational purposes have been studied under sponsorship of NAEB.[29] Satellite capabilities today do not make it possible to broadcast worldwide educational TV into areas that are not equipped with a network of broadcasting stations and relatively expensive television receivers. However, if a ground based broadcast system together with receivers in the hands of the public does exist, then a highly specialized and expensive satellite signal receiver can make a satellite pick up and become a source of distribution to such a national network.

Arthur C. Clarke, English scientist and author, foresaw the day when stationary satellites would make television available to everyone on Earth. He declared that:

> "Of all the applications of astronautics during the coming decade, I think the communications satellite the most important. --- it is now widely conceded that this may be the only way of establishing a truly global TV service. The political, commercial, and cultural implications of this, however, do not yet seem so thoroughly appreciated...
>
> "The printed word plays only a small part of this battle for the minds of largely illiterate populations, and even radio is limited in range and impact.
>
> "But when line-of-sight TV transmissions become possible from satellites directly overhead, the propaganda effect may be decisive, especially if it is coupled with a drive to produce simple and cheap battery operated receivers.
>
> "There could be few communities which would be unable to afford one

set (in Ceylon there are dozens of radios blaring in every village) and when we consider the effect of TV upon our own ostensibly educated public, the impact upon the peoples of Asia and Africa may be overwhelming. It may determine whether Russian or English is the main language of the future."[30]

On Monday, November 25, as this nation mourned the death of assassinated President Kennedy, solemn ceremonies were broadcast "live" to 23 countries with a population of more than 600 million, the largest number ever to be assembled for a "live" program. Interconnection was via RELAY, the U.S. communications satellite produced by RCA and NASA. European countries participating were Belgium, Holland, Portugal, Spain, Great Britain, Ireland, Monaco, Austria, Finland, Norway, Denmark, Italy, Sweden, France, Yugoslavia, West Germany, and Switzerland. Other countries were Russia, Hungary, Czechoslovakia, Poland, Bulgaria, Roumania, and East Germany. Later in the day other rites were beamed "live" to Japan. On Wednesday, President Johnson's speech to Congress was video taped and then played back minutes after he had finished speaking and sent via Relay Satellite to 14 Western European countries. [31]

The first synchronous satellite 22,300 miles in altitude and having a rotational period corresponding to that of the Earth, which makes it apparently fixed with respect to a given position above the Earth's surface, was launched in 1963. Ultimately, if improved space rocket boosters permit, and a transmitter power of 60 kilowatts can be achieved aboard such a satellite, then direct broadcasting to typical receivers in home use today would be possible.[32] The derivation of such a figure in 1961 was undertaken as an academic speculation. Today, other engineers are foreseeing the possibility of such a system within a few years time. Certainly the use of all types of satellites will become an increasingly important factor in program or course distribution technology.

VIII. LASERS

Light Amplification by Stimulated Emission of Radiation seems destined to become a future signal distribution method of great and possibly revolutionary promise for broadcast and communication services. Development of the Microwave (MASER) discovery of Professor Townes of Columbia University and others about six years ago led to the optical MASER or LASER. Generation of coherent(single frequency) radiations in the light and near visible light regions of the spectrum at the order of 10^{15} cycles per second or in the frequency vicinity of one billion megacycles has opened up a totally new field of energy generation endeavor. When it is realized that prior to this advent, 50,000 megacycles was about the upper frequency limit of radio radiation concern and that the LASER domain is 20,000 times higher than this frequency, some appreciation can be gained for the necessity of talking in terms of electron absorption and emission rather than dipoles, wave guides, and radio wave generation so customary in our broadcast, communication, and radar terminology.

At frequencies so high that the six megacycle television channel width seems insignificant, speculation has turned to the possibility of simultaneous relay of many television signals together across the country or from satellite to satellite splitting off or adding new signal modulation information as needed.

One potential is stated in terms of the relay of a thousand television channels across the country on a single light beam or possibly a beam in a hollow conductor.[33] Just three years old this past summer, great uses are prophesied in medicine, industry processes, and space communication.[34]

Mr. Oliver in the foregoing reference using current mathematical indications hypothesizes an 80 milliwatt (about one-tenth of a watt), gaseous continuous wave LASER with receiving and transmitting apertures of two inches in diameter that would carry a four megacycle television channel with a 40 db signal-to-noise ratio being maintained for a distance of 4,000 miles. While this is being done, today, with many amplifying repeaters intervening, the LASER signal would go the whole distance without any amplifying boosters along the way! While transmission medium losses and beam benders would reduce this distance by about one-tenth one can begin to appreciate the new threshold of development which looms before us.

Experiments in 1962 with the techniques for modulating and demodulating or the insertion of television material on the coherent light "carrier" and retrieval of the TV signal at the receiver have been successfully carried out over short distances in the laboratory. These are significant as the first steps in the practical application of such techniques in the communication and broadcast relay field.

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With this kaleidoscopic array of communication distribution technology, some in common use today, some ready for use, and some giving promise of emerging dramatically from the laboratory, the educator has at his command a fantastic modern genie to assist him with his educational processes. As he pushes forward with his application of these devices, to keep pace with the population explosion and the ever increasing burden of more rapid decision making in a shrinking world, one can sense the need for a proper orchestration for which the educator will have to write the score, using the new notes he fosters by his very educational processes. Now we can glimpse a bit more fully the intellectronics, "total communications," and "man machine coupling" to which our scientists and engineers refer and bring forth into being.

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EDUCATIONAL TELEVISION TECHNOLOGY

EQUIPMENT DEVELOPMENTS

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Commercial broadcast television soared to enthusiastic acceptance in the United States during 1946-1947. Today, nearly eighteen years later, educational television is doing the same but with a radical and most fortunate difference. The technical equipment for television is vastly better today than it was eighteen years ago. Our free enterprise system, with its inherent ability to improve, compete and to test out new techniques and ideas has removed a major, if not a fatal, stumbling block to educational TV during the early 1950's. Commercial television has borne the agony and expense of trying and testing many equipment designs, operational concepts, and production techniques. Today ETV can build on this backlog of development and experience.

For instance, consider kinescope recording equipment. In the earlier days of television, and even as little as five years ago, kinescope recording varied between barely acceptable, at best, to completely unusable on the poorer occasions. Background noise, grey scale, shutter bar interference, phosphor lag, and distorted audio all were major problems. A solution to one problem seemed to be made only at the expense of the others. Today, phosphors, lenses, shutters, video circuits, and film have been developed for recording systems that exceed the capabilities of 16 mm film.[1] Additionally, new high speed processing techniques, lenticular film, and recent improvements in 8 mm film open new areas of usage for film equipment. Today, educational television needs and uses as much film as ever. Its use is not decreasing, but tends rather to be increasing. This is in spite of the tremendous use of video tape recordings.

Perhaps the most significant equipment development in eighteen years of television would be the video tape recorder. This equipment shook the television industry when it was first introduced, and today it still is shaking the industry to its operational, programming, and production roots. Every well designed broadcast or closed circuit educational television facility includes at least one and usually several video tape recorders. The reasons, of course, are well known. The recorder permits production, revue, and distribution techniques that were virtually impossible before. Immediate play back, very high technical quality, and the re-use of the tape are among the more notable advantages of video tape.

Educational use of video tape faces a perplexing dilemma today, however, video tape recorders are on the market ranging in cost from about $10,000 to $75,000. What machine should be purchased? First, notice the two basic methods of video head scanning. The larger, more expensive machines use a transverse scan of a two-inch wide tape. The lower price machines use a helical scan on a tape of one or two inches width. The transverse scan machines have been"standardized" in technique to permit taped programs to be effectively interchanged with other similar machines. Additionally, the transverse scan system has reached a high degree of sophistication during more than seven years of intensive development. There are two American and three foreign manufacturers[2] of transverse scan recorders, each basically similar to the others but differing somewhat in operating and accessory features.[3] Minimum cost for a complete transverse scan recorder is about $40,000, but accessories and special optional equipment frequently will add $25,000 to $35000 more to the cost. Several manufacturers offer recorders that are completely solid state except for picture and waveform monitors for lower space, heat, and power requirements.

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[1] Simplified Operating Practices for Studio Cameras, Joe Flarety, 16mm File Prints Available from CBS Television Network, 1963

[2] RCA, Ampex, Shiba, Nippon Electric, and Fernseh GMBH.

The helical scan equipment recently appeared on the market from at least two American and two foreign manufacturers. Unlike the transverse scan recorders, helical scan equipment is completely unstandardized. Each manufacturer uses his own techniques and designs, none of which is compatible with other machines, and only rarely compatible with a machine of similar model. Thus, the helical scan units have a basic and very serious drawback at the present time of complete non-compatibility. A recorded video tape must be played back on a machine of similar model and frequently on the same machine on which it was recorded. In their present stage of development, helical scan recorders are not suitable for program production for broadcast stations or high quality closed circuit applications. Their low price ($10,000 - $15,000) and small size (large suitcase) does make them very appealing for special applications such as training aids, medium quality closed circuit applications, military surveillance, and equipment studies. The helical scan recorders have been used with special additional stablizing equipment by several commercial broadcast stations for news event recording where portability is essential and the lower video quality can be tolerated. Until the helical scan recorders are standardized to permit interchanging of recorded tapes, their use in educational television will tend to remain as training aids, secondary type services, and limited quality equipment for specialized applications.

Let us consider next what has happened to television cameras. Up through the late 1940's and early 1950's, the iconoscope was the film camera tube and the 5820 image orthicon was the live camera tube. During the early and mid-1950's the vidicon camera was developed with its vastly better quality to become the accepted "standard" film camera. Its simplicity of operation, low internal noise, and excellent picture quality have virtually relegated the iconoscope to the junk heap or a museum piece. Because the vidicon is basically simple in operation, and small in size, it was soon tried as a live camera in special applications. A severe limitation of the vidicon for live camera usage is the need for relatively high light levels on the televised scene. Recent developments in the vidicon tube have improved its sensitivity so that more reasonable light levels can be used. The "plumbicon" is the most recent of vidicon developments and can be expected, with its increased sensitivity, to widen vidicon camera usage to many areas formerly considered the exclusive domain of image orthicon cameras.

Image orthicon cameras have been the basic live camera for many years in spite of many severe shortcomings. The image orthicon is basically a complex

[3] Joseph Roizen, Television Tape Techniques Today, Broadcast Engineering, Nov. 1963.

tube, expensive, requiring complicated external circuitry, and until recently rather unstable in operation. The tube will produce excellent pictures with very low light levels, and possesses characteristics which makes it very tolerant of varying light conditions. This latter property has been used to offset improperly lighted studio scenes or uncontrollable outdoor scenes. The instability of image orthicons has been caused by thermal and electrical variations of critical adjustments during operation requiring frequent readjustment. The demand for extra high camera quality and stability for video tape master recordings has evolved a new tube development and radically redesigned camera circuits. The four and one-half inch image orthicon tube and cameras have solved the problems of instability through improved regulation of critical circuits, and picture quality has been noticeably improved. The tube complexity, expense, and complicated circuitry, however, still remain.

What is ahead for the live television camera? First, the image orthicon in both three and four and one-half inch sizes will probably remain as the "standard" for high quality studio productions. The large size, heavy weight, and complexity of image orthicons are not disadvantages in studios; in fact, their weight is an advantage in achieving smooth mechanical operation. Vidicons can be expected to be used in increasing amounts for studio usage where the production is simple or does not require elaborate staging. Vidicons can also be expected to be used increasingly in special event, news, sports, and other remote pickup applications. Their compact size and improved light sensitivity make them a natural choice for outdoor remote pickups. One European manufacturer[4] has developed a lightweight battery operated wireless television camera that offers new horizons in portable video cameras. With no wires to restrict his movements, but still with complete central syncronizing and communications control, the operator can be truly mobile in operation.

What else does television technology offer today? It may be summarized that virtually all equipment from camera to transmitter, from switching equipment to microwave repeaters have been undergoing radical evolutionary changes during the past two to five years. The heart of most of these changes has been solid state circuitry; the results have been improved pictures and operating techniques; the bonuses have been more compact equipment, lower heat loads, improved equipment stability, and less maintenance.

Solid state components such as transistors and diodes have literally revolutionized television equipment. With a very few exceptions, solid state components in properly designed circuits yield many significant advantages over similar circuits using vacuum tubes. But the evolutionary cycle of equipment development doesn't seem to end. One concept now appearing in commercial equipment is the "plug-in module." This permits very rapid replacement of entire circuits for faster maintenance and service. Additionally, modifications and changes can be readily made on basic systems with negligible outage or "down" time. Already, some users of plug-in modular equipment have found that

[4] Fernseh GMBH

repairs of defective circuit boards are too costly. A new board can be purchased and installed at less expense than paying a maintenance technician to repair it. Actually, we have been doing this for years with vacuum tubes. No one would dream of repairing a defective vacuum tube, simply because a new replacement can be purchased for a few dollars at any radio shop, and in some cases, even at the corner drug store. The disposable circuit module soon may be the next evolutionary step.

Modern television equipment is expensive; but so is obsolete equipment. ETV has a monumental task to perform and finite operating budgets with which to do it. Modern equipment will produce better pictures and sound. Modern equipment will cost substantially less to operate and maintain. Modern equipment has smaller requirements for expensive building space and air conditioning equipment. Modern equipment is readily available, and ETV must use it to achieve the tasks to be performed.

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WHAT ARE THE ECONOMIC IMPLICATIONS OF TV IN EDUCATION?

The impact upon a society of widely disseminated educational programs which heighten the information level and increase the cultural experience and appreciation of a substantial proportion of a population defies measurement. However, economists today are paying new deference to the increment added by education to the nation's economy.

The economic impact of the use of educational television, by broadcast or by closed circuit, when considered in the light of the specific educational tasks of an institution or a school system may be more nearly approximated and, perhaps, precisely measured.

The educational administration and policy maker is unlikely to find financial savings in educational television if he sets out to do only that which is accomplished by his institution now. When the additional factors of extending education to more students and of the necessity for improvement of the educational programs are considered, the educator can begin to consider educational television in terms of financial savings. If only the factor of new numbers is considered, financial savings may be possible if sufficient numbers of additional students are taught and ETV costs are offset against the costs of providing teachers and learning space of the same quality in the conventional manner.

The great, inseparable intangible which defies capitalization, but which cannot be disregarded in measuring the economic impact of educational television is the improvement of teaching quality. If educational television is to be employed to its full capabilities, then other costs must be added, principally, the costs of integrating other educational media into the use of educational television. The consequence will probably enhance and improve teaching throughout the system or institution though the cost would be attributed to television.

The whipping and stirring of educational television into the institutional operation also has its influence upon numerous other aspects of the educational patterns pertaining to that institution, such as class scheduling, the non-classroom utilization of educational television by the individual student, the introduction of team teaching, the recapture of teacher time to be applied in other educational or research endeavor, and improved use of the teaching associates or assistants under the guidance of the master teacher. All of these have economic implications which may be most difficult to measure but which may mean an improved use of time and talent in the total institutional operation. Like stirring chocolate into white cake mix, educational television soon begins to show its traces in many facets of the institution until, finally, it enriches and colors the entire operation.

Volume operation is the key to financial savings by using television to teach additional numbers of students. If the volume is increased sufficiently, financial savings may well be realized as against the cost of tackling the same problem by conventional means. When television is approached in terms of accomplishing a larger teaching task with a better teaching/learning result, the odds greatly favor the use of educational television. The variables in each institutional situation and in each television system are many, and generalization becomes risky and perhaps not helpful to the educator planning ETV for his institution.

The administrator and policy maker in education, nevertheless, need not experiment in the dark. There exists an accumulated reservoir of experience and knowledge to which the educator may find relatively easy access. Valid judgments can be made in each situation as to when to use educational television, how to use it, and how to think about the economics of this new teaching medium.

ECONOMICS OF INSTRUCTIONAL TELEVISION

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I hope that we can agree here that the costs of instructional television are subject to many variations. Nevertheless, we will try to shed some light on the question of costs.

In an examination of costs, we must not only admit that there are infinite variations, but we must grant too that the situation changes rapidly and constantly. Television is on the growing edge of technology. It had characteristics four or five years ago which seem both remote and almost simple today. We can hardly doubt that change and development will continue to be rapid for several or many years to come. For example, just five years ago we wrote a little paper on the costs of ITV.[1] It wasn't outstanding, but it looked adequate then and it has a few merits still. However, the paper intentionally ignored any consideration of videotape recording and the cost implications of using videotape, because there was no basis for estimating effects. Now, five years later, it would be foolish to ignore videotape. Many ITV installations have recorders, and, from what we see, most operators who lack videotape wish desperately that they had it. Not only does it work well, opening up new possibilities, but hourly operating costs are perhaps $10 to $15, as opposed to double, treble, or quadruple that cost for staffing and operating the television studio.

If it is true that television technology doesn't stand still, then it is double true of video tape recording. Costs associated with videotape are changing as rapidly as is the state of the art. Fortunately, it appears that these costs are always moving downward. Originally, the recorder represented about a $50,000 to $60,000 investment. Costs for tape material were also high, with a one hour tape costing about $200. Before long, recorders appeared which promised to halve the investment in equipment. Still later, the possibility of another 50% reduction appeared. Now, the British are suggesting that a recorder, the TELCAN, may be offered at a price under $1,000 - perhaps under $500. And not all of the cost story is based on machine investment. The first of the marketed machines advanced the tape at the rate of 15 inches per second, thus requiring the $200 investment in a one hour tape. Now, machine modifications can reduce the speed by half. For the institution which has 100 tapes in its growing library, this reduction alone saves an investment of about $10,000.

If we have overstressed the uncertainties and the variabilities of instructional television costs, it is regrettable, yet it is also a reality and deserves more than a passing glance. We will try, though, in the remaining remarks to consider costs and cost factors that can be more concretely discussed.

Five years ago it seemed satisfactory to think in terms of four principal factors which influence the costs of instructional television. The first of these is the salary level of the television teacher. For college and university teachers, we then assumed a teaching load equal to twelve classroom contact hours per week, and we studied costs under three conditions or levels of salary; $6000, $7500, and $9000. Remember, that was five years ago. Today, we should probably forget the lower salary figure and add a hypothetical $12,000 salary to the picture. This higher salary may not be realistic for secondary schools, but it certainly is realistic for many, if not for most universities.

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[1] "Comparative costs for televised and conventional instruction," Audio Visual Communication Review, Vol.VII, No. 4 (Fall, 1959).

The second factor worth considering is the release time allowance given to the television teacher. Even though some television teachers ask and receive no special consideration for their efforts, it is typical to allow release time in the ratio of two for one, three for one, or even four for one. At Purdue and at many other institutions, release time of two for one is fairly common. In effect, then, the television teacher teaches perhaps a three hour course and receives credit for six hours on his teaching load. In calculating costs, the release time factor operates as a multiplier of teacher salary costs.

The third factor - and an important one - is the hourly operating cost of the television facility. Five years ago, it seemed that estimated costs of $20 and $30 per hour of use were representative of the mid-range of costs. Our own experience justified these figures, and the second of the two major reports from Pennsylvania State University[2] gave cost figures which fell neatly in the middle of the $20-30 mid-range. If someone wishes to argue that he can operate for $10 an hour, or that he can't operate for less than fifty or even $100, few will doubt him. We would even grant that an hourly cost of $40 may be more representative today.

Some points worth considering in arriving at an hourly cost are these: A single studio, two camera closed-circuit system may cost somewhere in the range of $30,000 to $60,000. Within the cost, we can assume that coaxial connections with classrooms have been provided and that twenty or more classrooms are equipped with receivers. The amount of use each year can be estimated at 1000 to 1300 hours. Recent experience at Purdue has shown approximately 1200 use hours per year and other institutions match this. If the 1200 hour figure is granted, and if a $30 hourly use cost is assumed, then the television operation has an annual budget of $36,000 for staff salaries, maintenance, supplies, and amortization of the investment. No one is foolish enough to suppose that $36,000 will cover a year of resounding educational spectaculars, but necessary expenses have been met with such a budget.

The fourth factor in the costs is the expense of providing classroom and other related assistance to the television teacher. At the college-university level, this normally is translated to mean graduate assistants. These assistants will be responsible for such duties as conducting discussion sessions, supervising classrooms during television periods, grading examinations, counseling students, and everything else that may be the lot of an academic coolie laborer.

To review, then, the four cost factors which are common and necessary to consider are instructor salary level, instructor release time, hourly operating costs for the television facility and salaries of the teaching assistants.

Now, to avoid repeating our omission of five years ago, some words should be said about videotape recordings and their use. The best of the recorders can

[2] Carpenter, C. R. and Greenhill, L.P. An Investigation of Closed Circuit Television for Teaching University Courses - Report Number Two. Pennsylvania State University, University Park, Pa.: 1958.

be purchased now for something less than $50,000. Assuming a ten year life, which is completely within reason, the amortization of the investment would be a $5,000 item annually. In addition, an engineer will be needed. About $7500 will pay his salary. Standard maintenance and parts will be perhaps $1500. Finally, the destruction of tape and the interest on the investment in a library of tapes can easily be $2000. On an annual basis, the budget for videotape recording would be about $16,000. If the machine, like the studio, is used 1200 hours per year, the hourly cost is a little more than $13. This, of course, is not quite as good as it looks, since it is an additional expense when recordings are being made. For example, if the hourly cost for studio and related personnel is $30, then an hour in which a recording is made costs about $43. The second blemish on this rosy picture is that a series of instructional tapes is not likely to remain unchanged for very long. It should be safe to suppose that 10% to 20% of the recorded tapes in a series will be re-recorded each semester. This will not be a major source of increased costs, but it is only realistic to assume that teachers will want to try for improvements on a noticeable fraction of their recordings.

In contrasting costs for televised teaching and for conventional teaching, we must use quite a few suppositions. With some luck, a few suppositions will be liberal with money and others will be conservative. Hopefully, the extremes will offset one another.

For conventional instruction, there are many costs besides the teacher's salary, but we will ignore them. Classroom heating, library services, and many other costs could be listed, but there is no reason to suppose these are different costs for conventional teaching than for television. As an example, of conventional teaching costs, let's assume that students are to be taught by a teacher who earns $9000 for two semesters of work. Assume, also, that the teacher carries a teaching load of twelve classroom hours per week. Finally, assume that class size is 30 students. Under these conditions, the instructional cost is about $12 per student per credit hour. This is fairly expensive teaching. If we could fire this hypothetical teacher and hire another for $6000, the cost per student per credit hour would be about $8.50.

With these costs as a background, visualize a television alternative. In the alternative, pay the instructor $9000 salary for two semesters. Give him access to television facilities which cost $30 per hour. Give him release time in the ratio of three for one. With this, a three credit course would be entered on his record as if it were a nine credit course. In addition, give him a graduate student to oversee each group of 30 television students. Under these conditions, our hypothetical case would have a cost picture something like this: for 120 students, the cost per credit hour would be about $16.50. For 180 students, cost would drop to about $12.00 For 240 students, it would drop to about $9.50. If you could arrange for the system to handle 420 students at one time, the cost would be down to about $6.50.

In this example, TV costs become equal to conventional teaching costs - also with a $9000 teacher - when TV enrollment reached about 180 students. TV became competitive with the $6000 teacher when enrollment reached about 240 students, even though the television teacher receives a higher base salary, has the use of the television facility and the help provided by its staff, receives an attractive amount of release time, and is aided by a group of teaching assistants. This example, shows at least two things which deserve restatement. First, when fairly expensive forms of conventional teaching are used as a basis for comparison, it is not at all impossible for television teaching costs to become competitive or even for television to offer significant cost savings. This is not altogether supposition; it can be documented with adequate information from case histories. Second, it must be stressed that the major costs of teaching by television are present as soon as the first student is taught; each additional student may add some further cost, but this is miniscule in comparison. The same is not true for the more conventional forms of teaching. Conventionally, once class size and instructor salary are decided, the cost burden for the first and nth class or section are nearly the same, if not identical.

In closing, two words of caution seem in order. The first of these is that television teaching can, under some conditions, offer clear cost savings, but no one guarantees that it will, at least not immediately. Until educators are more familiar with the medium, it would seem foolish to seek only those uses which are financially advantageous. It may take several years for an institution to build faculty use of and respect for the system; any institution employing television can attest to this. Even when the system reaches the point of full use, it is improbable that every televised course will be defended on the basis of its cost savings. True, a few of the courses may be of the sort that warms hearts in the fiscal office, but others may be teaching only 80 students or some similarly small number and these, it seems, are the price of progress.

Second, over-concentration on financial savings can trap the unwary. It can create expenses which seemed originally divorced from the decision to use television. The easiest explanation comes in the form of an example. Suppose that the enrollment in freshman chemistry is 800 students and that these students constitute the vast majority of the freshman class. Suppose, too, that your television facilities are adequate to accommodate all 800 students in classrooms at one time. You are attracted, of course, by the prospect of distributing teacher and facility costs over 800 students, so, you arrange to teach chemistry by television to this one "block" of students, all at one time. Having made that decision, what becomes of the schedules in freshman English, in general biology, in modern languages? Quite possibly, the periodic removal of 800 freshmen from all alternative courses temporarily stagnates operations in other departments of the school. Where specialized facilities, such as those for language instruction, biology, and physics have been vacated, very real cost implications can be found. It is, therefore, suggested that block scheduling of hundreds of students always be examined for its effects on other parts of the instructional program. Even though the television facilities may be adequate to accommodate very large numbers simultaneously, this will not inevitably be the most prudent choice.

The surprising thing is that televised teaching works; with it, students can learn many things well. The interesting and tantilizing prospect, to some, is that it can save money, even though not automatically. But the challenge is to find how to use it, when to use it, and when to be casual about its costs.

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WHAT ARE THE SPECIAL LEGAL, PROFESSIONAL AND ETHICAL PROBLEMS IN EDUCATIONAL TELEVISION?

The relationships created in the use and programming of educational television are generally analogous to those which pertain in the teacher's relationship to production in other educational media. However, not until educational and instructional television reached their current state of development and use have the legal, professional and ethical considerations inherent in these relationships come to focus.

Out of the use of ETV and ITV in many instances comes a recorded product. From this fact there arises a series of questions concerning the ownership of the product, the rights of the institution and the teacher to control its use, its revision, its re-use, its exchange, and its resale and distribution.

There is a lag between the technological and program development of ETV and ITV and the policies and practices which might be expected to govern these relationships. Much attention is being given today by such groups as the American Council On Education and the National Education Association to the development of guidelines in the appropriate management of the rights and interests growing out of the relationships in educational television.

No widely accepted, or standardized, patterns with respect to the compensation of teachers teaching via educational television have developed. The practices vary widely with special differences being apparent between the practices in the elementary-secondary school levels and higher education. There is a general concurrence in the recognition that teaching via television involves a special effort, the devotion of much time and an expression of creative and professional talents which place the teacher in a different relationship than that of his classroom colleague. With this concurrence there is a growing agreement that some form of additional or different compensation is warranted for the television teacher.

The professional interests of the teacher in a recording of his professional practice are generally agreed to give the teacher a special right in the matter of revising and up-dating the effort as to when and to what extent revision should be undertaken. Not so clear are the kinds of interest a teacher might properly have in the re-use of his television teaching within the same institution and its use outside of the institution. Should the teacher have a voice in control of the use of his work? Should he be compensated for repeated use either on or off the campus?

The fact that educational institutions and systems mutually aid one another through the exchange of TV teaching materials discourages the realization of income or profit from extending the use of teaching film or tape. Hence, consideration of additional compensation for use outside the institution, or the payment of royalties, has produced no standardized practice largely for lack of experience.

The administrator using educational television can expect to see standards in these relationships evolve as ETV and ITV grow, but pending this event, he is well advised to reach written agreements with the television teacher in the advance of the effort in the best interests of good working relationships and the avoidance of future disagreements. The elements to be included should cover compensation, working conditions, supplementary help and such rights as are to be reserved in re-use of the material and in its eventual revision.

Either in addition to the written agreement with the individual teacher, or in lieu of it, an institution should consider the establishment of general policies governing teacher or professor participation in teaching via television. Such policies, though they may be frequently revised, will provide an important reference point as television is employed in education in new subject matter fields and in new ways.

Generally, the ownership of an educational television product is deemed to rest in the institution with whose resources it was produced. In addition, to its consideration of the professional and ethical relationships involving the teachers, the institution should look to the protection of its own interests through the use of copyrighting. Relatively little educational television production, or material supplementary to educational television, is now being copyrighted.

The Copyright Act of 1909 now operative in the United States, is under serious study at this time looking toward revision by the Congress. The interests of educational television are deeply involved in the revisions which have been proposed. Of major concern is the proposal to delete the provisions which allow the use of certain copyrighted material when the use is not-for-profit. Such a deletion would have serious implications for educational television.

Other changes under discussion having implications for educational television are the codification of the "fair use" doctrine as developed by the court interpretations and the inclusion of a provision which would hold that a performance of a creative work is tantamount to publication of the work. If such were the case, the creator would lose all his common law literary property rights unless he had undertaken to protect them under the copyright statute.

Experts in education and in the field of copyright law are expressing alarm at this time and urging that education and educational television look to their interests as they may be affected by the proposed revision in the Copyright Act.

Just as the new television technology and its application to education will cause changes in the methods and processes of education, so will follow changes in the rules, regulations and the laws which bring order and stability to the professional and legal relationships involved in educational television.

THE PROFESSIONAL RIGHTS
AND
RESPONSIBILITIES OF TELEVISION TEACHERS[1]

Harold E. Wigren, ETV Consultant

National Education Association

... Is a television teacher a professional actor/performer or a teacher?
... Should on-camera television teaching be considered a special assignment entitling the teacher to higher compensation?
... What constitutes an equitable teaching load for a TV teacher?
... Do teachers have residual rights in programs which they have created and which are used again and again by their own school district? If so, what are these rights?
... Should TV teachers receive additional compensation when their programs are videotaped and re-used within their school district and/or by other school districts?
... Under what conditions does the teacher have both the right and responsibility to revise his recorded materials? What arrangements should be made about time and salary for the teacher who makes such revisions?
... Should TV teachers be subject to the same contracts as other teachers or should they be given special contracts? If the latter, what should such contracts include?
... Should teachers sign a release to permit re-use of their materials into perpetuity?

****

The advent of television in instruction has brought into focus these and many other questions which need to be resolved by the profession with all deliberate speed if television is to serve education to the fullest.

But these problems and questions are not peculiar only to educational television! The same questions which are asked regarding the teacher's rights in television programming can also be asked in regard to his rights in programming on other media as well. Television is simply the initial beachhead for skirmishes which will likely spread to programming and use of other media in the future. Other types of media and materials that will likely feel the impact of these issues might be enumerated as follows:

1. Educational television programs ("lessons") - live and recorded
2. Radio programs
3. Programmed learning materials
4. Educational films
5. Sound recordings (phonograph disc, magnetic disc and tape, film recordings)
6. Filmstrips, slides and other transparent materials for projection
7. Microreproductions
8. Maps
9. Copying services, including microphotography
10. Storage and retrieval systems, computers, IBM, etc.
11. Other

Unquestionably, teachers who are creating programs for use on television and other new media have a professional stake in these new developments. With the introduction and rapid rise of technology in education, the profession is faced for the first time with professional, legal, and ethical problems which are both "sticky" and complicated. These are problems which the profession did not have to face 20, 10, or even 5 years ago!

Educators presently find few guidelines to assist them in making policy decisions which are particularly crucial during this period when technological advances of all types are finding their place in education. There can be little doubt that considered judgment and resolute action are needed if these new developments are to be wisely incorporated into educational programs, with practices that are fair and just to all parties concerned.

NEA Takes Action

Recognizing that the profession needs insight and direction in order to understand and resolve problems which are arising in this area, the NEA has been exploring for the past two years a constellation of problems relating to the professional rights and responsibilities of teachers engaged in new media developments, particularly television. In March 1962, the NEA convened a national conference to identify and deal with these issues, involving not only NEA organizations but representatives of other educational and media groups as well. The conference made several recommendations:

1. That NEA set up a special project to deal with the complex issues arising in this general area. (This was done in July 1962)
2. That NEA provide tentative guidelines for school administrators and teachers who are engaged in television programming.
3. That NEA obtain legal counsel to advise teachers on these issues.
4. That NEA plan for grass root discussions of these problems at NEA departmental meetings in order to acquaint teachers with their rights and responsibilities in these matters.
5. That NEA collect a file of available TV teacher contracts which now are in use.
6. That NEA make a survey of practices in selected school systems.

In October 1962, immediately following the strike on WNDT (New York City's educational station), the Executive Committee of NEA issued a tentative guidelines policy statement on these matters and directed that this statement be discussed in a series of "national conversations" throughout the school year in order to get reactions and suggestions as to necessary revisions. The Executive Committee also requested that appropriate action be taken to protect teachers from exploitation as these developments gain momentum.

During the school year just closed, The Executive Committee's guidelines statement has been widely discussed at national, regional and state conferences of classroom teachers, superintendents, supervisors of instruction, television teachers, and media specialists. These discussions were lively and spirited, often characterized by considerable controversy. Each group drafted changes in the original statement or developed a revised statement of its own. An ad hoc committee of nine individuals, representative of some of the major conferences held, then drafted the final statement which was adopted by the NEA Board of Directors on June 29, 1963 as an official policy statement of the National Education Association. The project staff also has conducted during this school year a survey of selected school systems to determine practices and policies now in operation relative to television teachers.

Some Emerging Underlying Generalizations

Throughout the national conversations several generalizations emerged, however, which seem to be basic in the thinking of most of the groups - and which were reflected in the final official policy statement which was adopted:

1. A national formula for TV teaching (spelling out compensation, work load, re-use, etc.) cannot be developed because of differences in ownership of stations, purposes and techniques of television teaching, and policies of individual institutions. Guidelines can, however, be established.

2. Policies adopted in this area should be consistent with local procedures and practices relating to other teachers also on special assignment within the school program.

3. Policies should be developed cooperatively with the participants. TV teachers should be involved in determination of any policy which affects them.

4. Policies should spell out the professional rights and responsibilities of both the investor and the participant - i.e., the school district and the TV teacher.

5. Policies should be written agreements specifying any rights which are reserved. (Attorneys advise that teachers have no rights unless they are expressly reserved in writing. In effect, there is no such thing as "residual rights" which are due teachers simply because they are teachers or citizens. Such rights must be spelled out in writing.)

6. Written policies should cover compensation, working conditions, supplementary help and reserved rights in re-use of materials and in revisions.

7. Policies should be subject to periodic review since the field is so dynamic.

8. Insofar as possible, there should be a free exchange of information among members of the profession.

Major Policy Guidelines

The official policy statement adopted by the NEA underlines certain key points of agreement relative to the professional rights of TV teachers:

1. That television teachers should be professional educators - not professional actors - and should be allowed to choose the professional organization which speaks for them in matters of negotiation with boards of education and with college trustees.

2. That TV teachers should be entitled to share in any revenues received from the sale or rental of their programs. (This might be done by paying TV teacher initially more per year while he is on this assignment, or by paying a royalty per program.)

3. That TV teachers should have the right - and responsibility - to revise and edit his materials and to even withdraw them on certain conditions, in order to avoid programming obsolescence.

4. That TV teachers should receive the same benefits as other teachers who are on special assignment.

5. That television teaching should be considered a full-time assignment if quality programs are to result. A supporting staff of graphics and production persons is also essential.

6. Television teaching is a team operation - not a "star" solo performance. To be effective it must be a team effort including the receiving teacher, curriculum coordinator, content specialist, producer, and others.

7. TV teacher should be in the employ of the school district or university at all times and subject to all the same benefits to which other special teachers in the school program are entitled.

Some Areas of Controversy

During the grass roots discussions held throughout the nation, several areas of conflict arose among the participants. Shades of differences in viewpoints were evident from the start and the differences were not between one group and another (i.e., between TV teachers and classroom teachers, or between superintendents and TV teachers). There was evident a wide range of differences in points of view even among TV teachers themselves. In some instances, these differences were greater within the TV teacher ranks - between public school and college levels or between teachers on the West and East Coasts. One major controversial area, as one might expect, arose between the viewpoints of school administrators and TV teachers on the matter of additional compensation. Should the TV teacher be paid more than the classroom teacher? There are, of course, two sides to the question.

The TV teacher viewpoint maintained that additional compensation is justified for a number of reasons:

... He has an enlarged area of responsibility for which he should be paid more. He is teaching several hundred students at one time whereas the classroom teacher has 35 to 40 in most instances.

... He is a demonstration teacher teaching before hundreds of his colleagues.

... He puts his professional career on the line once he's "in a can and circulated around the country."

... He must always be in a "go" position. He cannot have an "off day."

... Something of the TV teacher himself is captured on the video recording.

... Considerable emotional and physical strain is involved in TV teaching.

... The demand for his services as a consultant increases and he inherits more work as a result.

... TV teaching is a creative art which should be adequately compensated.

On the other side of the coin, the administrator argued in many instances that a single salary schedule should apply regardless of whether you were teaching on TV or in the classroom and gave these reasons for his viewpoint:

... The TV teaching assignment is a teaching assignment primarily and television secondarily. Education doesn't change just because it goes on camera. As a teacher he should receive the same benefits - and salary - as other teachers receive.

... The TV teaching assignment is performed on school time and the program thus produced belongs to the school system and not the teacher. The teacher assigned to TV is paid for his work as are other teachers. He did the TV assignment in lieu of something else. All teachers are subject to assignment.

... The major investment in the program and the tape was made by the employing institution.

... The TV teacher will likely get a better position later as a result. (Many superintendents recalled that TV teachers ofter were promoted to a principalship or to a supervisory assignment and never did "go back" to the classroom!)

... TV teaching is a team proposition. If, therefore, the TV teacher gets more money, what about higher pay for other members of the team? Where do you draw the line?

... The cost of operating an ETV facility is a very expensive undertaking even under the most ideal circumstances. The necessity of having to pay TV teachers more would impose an additional hardship on the administration and in some cases make operating costs prohibitive.

The controversy went on and on, with each side having to make compromise along the way. Other areas of controversy revolved around the method of compensation - whether larger payment at the outset for release of all future rights or royalty payments; compensation for revision and re-editing; compensation for re-use within the school system and for extended use outside the district. There was, for example, a rather widespread viewpoint that where no outside revenue is involved in the re-use and where lessons were re-used within the same academic situation for which they were originally produced, no additional compensation need be made. Not all TV teachers would subscribe to this, however!

In one large general area there was rather unanimous agreement. TV teachers have certain rights which, though not inalienable, should be and must be reserved in writing. These include the right to update materials which have become obsolete; the right to be informed when their programs are re-used by other school districts and universities; the right to be a party to negotiations on matters which affect them; the right to share in any income received from the sale or rental of their programs; the right to be given adequate time for preparation of programs. A majority - but not all - of the participants in the various conferences likewise felt that the TV teacher should have the right to decide where a given program will be used and under what conditions. For example, some TV teachers want the right to prohibit a segregated school district from using their program. They maintain that they would not teach in a segregated school district themselves; therefore, they would not want their program used in a segregated district. One conferee asked, "Would the opposite situation also hold?"

NEA Survey of Practices

In a survey of practices being followed by local school districts in regard to these matters, the NEA found that practices vary widely from well thought out policies and procedures to haphazard ones. This is to be expected in an area which is so new and expanding as rapidly as is educational television. In summary, however, in a poll of 40 large city and county school districts, the following practices might be reported:

1. Work load for TV teachers ranges from one 20-minute program per week requirement in one school system to one 30-minute program daily. The average load is 80 to 100 minutes per week.

2. Compensation also varies - supervisory status is granted to TV teachers in one city; $500 additional is given per semester in another; 10% more annually is provided in another; $60 monthly in several others; extra summer employment in still others. In one city, TV teachers receive $25 to $150 per program according to subject and type of program.

Dear Sirs:

In consideration of my appearing on one or more television programs of the series entitled__________________ and the fee paid therefor, I hereby authorize you to record on film, tape or otherwise, my name, likeness and performance and to use and to authorize others to use such recordings or films for educational television and radio broadcasting over stations throughout the world, for audio-visual purposes and for general educational purposes in perpetuity. You may also use my name, likeness and biography for publicizing and promoting such broadcasts and other uses.

By______________________________
Signature

Gentlemen:

In consideration of my appearance on the television program entitled ____ I hereby authorize you to use and to record on kinescope my name, likeness and performance, and to authorize the Public Schools to use such kinescope for educational television broadcasting in or elsewhere for audio-visual purposes in perpetuity. You may also use my name, likeness and biography for publicizing and promoting this telecast.

I also warrant and represent that to the best of my knowledge all materials used by me on the above named television program are my own or material which I have full authority to use for this purpose.

____

Witness:

____

3. As to revision rights, the usual pattern seems to be three years and this "by common consent" or"mutual understanding."

4. Most cities tape their programs for future use. A few large cities are exceptions to this, however.

5. Most TV teachers presently get released time but no additional compensation.

6. Most systems do not presently pay TV teachers more for re-use within the district or outside. There is a slight margin in the direction of paying more when programs are used outside rather than within the district.

7. College teaching is most frequently done as an extra assignment. Not so in public schools where released time is given.

In Conclusion

There are no magical solutions to these knotty questions. The above practices should not be considered as adequate solutions in any sense. They only reflect practice - unguided and misguided, in some cases - at the moment. They report what is and not what should be. Equitable conditions are difficult to achieve. The National Education Association, in establishing guidelines in this rapidly evolving area of concern, recognizes that such guidelines must necessarily be subject to such future changes as continued experience may justify.

#

KEY DISTURBANCE AREAS

1. Personnel Problems
   a. Teaching load and released time
   b. Compensation
   c. Contractual agreements
   d. Unions
   e. Re-use by school district
   f. Use by other districts, networks
   g. Time and salary for revision work

2. Copyright and Residual Rights
   a. Of broadcast and re-broadcast materials
      (1) By whom
      (2) Royalties
   b. Of related materials (study guides, visuals for use on television)
      (1) By whom
      (2) Royalties
   c. Use of copyrighted materials
      (1) Fair use
      (2) Reproduction

3. Professional Standards
   a. Institutional accreditation
      (1) Graduate television courses?
      (2) Under-graduate television courses?
      (3) Programmed courses?
   b. Certification of television and/or classroom teachers
      (1) In total teaching?
      (2) In supplemental teaching?

4. Problems of Control and Autonomy
   a. Curriculum problems: relations of state, regional, national networks to local school authority and control of curriculum
   b. Relationships between regional, state, and local programming
   c. Financing - multi-school district

5. Professional Ethics
   a. "Featherbedding"
   b. Free exchange versus extra pay
   c. "Outpricing" new developments

PERMANENT WAIVER USED BY THE PUBLIC SCHOOLS FOR THE ASSIGNMENT OF TEACHERS' RIGHTS IN CONNECTION WITH PRODUCTION OF TELEVISION PROGRAMS

Assignment by the Teacher to the Board of Education

1. KNOW ALL MEN BY THESE PRESENTS, for and in consideration of the sum of One Dollar and in consideration of my employment as teacher by THE BOARD OF EDUCATION OF THE CITY OF I do hereby grant, assign and set over to THE BOARD OF EDUCATION OF THE CITY OF , all common law rights and/or all the copyrights and/or the right to secure copyright in the United States and all other countries of the world, (in the name of THE BOARD OF EDUCATION OF THE CITY OF or otherwise, in the Board's sole discretion), in and to a certain dramatic, literary, musical work, lectures or addresses written by me, including all right and title in the manuscript thereof and including also under such grant and assignment, without in any way limiting or restricting the same, the entire literary publication, novelization, dramatization, performing, mechanical reproduction, radio and other broadcasting, television and silent, sound, talking and musical motion picture rights therein for all countries of the world and in all languages, the exclusive right to the characters in such work, and any and all other rights of any nature that may hereafter be invented, discovered or come into existence.

2. I hereby grant, assign and set over to the Board forever all renewals of copyright and also the right to renew and secure renewals of copyright in all countries, in my name or the Board's or otherwise in the Board's sole discretion, in such work and in any and all versions made in pursuance hereof. This assignment is intended to cover work already prepared for Station -TV, and to be prepared for Station -TV, only while the assignor is in the employ of the Board of Education.

IN WITNESS WHEREOF, the undersigned has executed this assignment this day of 196 .

____

ITV LEGAL PROBLEMS

COPYRIGHT, CLEARANCE, OWNERSHIP

Dean Fred Siebert, College of Communication Arts

Michigan State University

I have accepted an assignment from the American Council on Education to make a study of three groups of problems under the auspices of the U.S. Office of Education which financed the project.

The report itself is double-spaced and runs 96 pages; the appendices are single spaced and runs 125 pages. I am presenting, here, an outline of the sections of the project and proceeding to discuss only those sections in which this group may have a particular interest.

The first page of the outline presents the Table of Contents. The second page is the List of Appendices, which consists of sample contracts, and policy statements of various types for use by various types of educational institutions. The staff memoranda may have interest for some. Part four is presented in its entirety, for these are the recommendations of the report calling for some future activity or action.

There are three sets of problems. The rights and compensations for teachers in educational programs for the media, Part III, has been discussed in this seminar. I shall confine myself as far as possible to parts one and two, Protection for Educational Programs which are prepared for the new media. How do you protect your programs from unauthorized uses? What steps should you take? What material can you use in the preparation of your programs? This was not a very serious problem when we just had radio. It became more serious when we got television. It became quite serious when we got video tapes and other types of audio tapes. It raises many questions, especially when you enter into the problems of the re-use of the programs which are produced when they are more than live.

As most of you know, our present copyright act was passed by Congress in 1909. It is quite out of date in many aspects, and it has been amended occasionally, but it needs a complete and thorough revision. This, the Copyright Office has undertaken to do, and it has spent a considerable amount of time and money on studies looking toward the revision of the Copyright Act. It has been holding panel sessions in Washington for discussion of its proposed revision.

If Congress has many serious problems before it, it's not going to take the time necessary to enact a new Copyright Act. If all the people who have problems in the field of copyright can mutually solve them and agree on a solution then Congress is likely to accept that solution and pass a revised act. But, if there is wide controversy between various groups who want different types of provisions in the Copyright Act, I don't think Congress is going to take time to solve those problems at this particular time.

Let me give you an example. When does publication take place? This is a technical term. It's quite important, because you can rely without any formalities on the common law of copyright or literary property. But once you publish, then you lose those rights, and unless you copyright and perform the formalities of the copyright statute, you have no rights. So the question of whether it's published is quite important.

At the present time, the law is that performance is not publication. It means that you could run a motion picture indefinitely. It means you could put on a play, or a performance, no matter how often or to how wide an audience, and still not have published. You could retain your original rights in the production, even though it is performed publicly without complying with the formalities of the Copyright Act. The Copyright Office wishes to change this and to put into the act the provision which would make performance a publication. I understand that there's been quite a bit of objection to it. The people who represent playrights, the motion picture industry, etc., object to this. So whether or not it will be included in the final draft, I don't know. If problems like this can be solved to the satisfaction of all the interests concerned, then I think Congress would enact such agreements into copyright law.

In connection with the revision of the Copyright Act, one of the problems that is of the greatest interest to educational television is the proposal to take away the present provision which permits the use of other people's material when the use is not for profit. Now, there is no educational exemption in the Copyright Act. That word is not used any place, but if you want to use material on a not-for-profit basis, this is possible for certain types of material under the terms of the statute. This provision particularly refers to literary material and music. This distinguishes educational television from commercial stations which do not have that exemption.

The original proposal of the Copyright Office was to retain this not-for-profit exemption. After panel sessions, at which there was strong, vociferous and prolonged opposition on the part of the music publishers, on the part of textbook publishers, on the part of other interested parties to the effect that this should be eliminated from the act, the proposed to delete the provision was made a part of the revision. The protestors asked: How can you as educators hold your head up in any kind of moral sense when you are cheating on the creators of this material and not paying for it? So the Copyright Office straddled the question. They said, if we present a revision of the Act to Congress it will contain two alternative sections on this point: 1) in which it's retained; and 2) in which it is eliminated.

Literary material and music are definite terms in the Copyright Act. The term literary material does not apply to visual materials, of which a film is an example. The way the Copyright Act is drawn, this exemption which favors not-for-profit use by educational institutions does not extend to all types of material, but only to these two particular groups - all literary, written materials, and all music. All others, including visual materials are not so exempted. This fact prompts another argument. How come the copyright owner of a photograph can collect from you for its use, even though it's not-for-profit, whil a composer can't?

No, a picture is not literary material, even though it's part of literary material, it's not literary material. A picture is copyrighted under a special section of the Copyright Act as a picture, and therefore, does not come under the not-for-profit exemption.

Any material used that is other than literary material and music, even though it's a not-for-profit use is an infringement of the copyright owner's right.

We have two kinds of motion pictures, photo plays and motion pictures other than photo plays. A photo play takes on the rights of a drama. A drama has peculiar rights in it. You cannot perform a drama publicly without the consent of the copyright owner, even though it's not-for-profit. When you perform a drama on a closed circuit, are you performing it publicly? That's the question I have to ask. In some of your closed circuit operations, it may not be public. Drama is the one exception that you might use on closed circuit. This exception does not pertain to other types of material.

This is a concept that was developed by the court in their judicial decisions interpreting the Copyright Act. The judges, over a good many years, came to the conclusion that certain types of limited use ought to be permitted in spite of the fact that a copyright right was given to the owner or publisher. This doctrine as set out in judicial decision is quite vague and probably desirably so. We have two problems in connection with it. First, certain individuals who want to codify this concept, that is, to put it in the form of a section in the Copyright Act. I have looked at this problem for quite a while, together with my associates, and we are opposed to such codification. The British Copyright Act was amended some years ago to put in a fair use provision. We checked with the British people about how it operated, and they said they liked it better when it wasn't in their Copyright Act. Now, since it's vague, there is a tendency on the part of individuals who have a special interest to try and direct it to their interest. The book publishers, more than others, would like to limit the right of fair use to quoting a hundred words or some such limitation as that. And they have proposed to the U.S.Copyright Office that such a provision be included in the revision. For example, all of these statements, "All Rights Reserved," "No Copying, Except For Review," "Quotations Limited To 100 Words",etc. are strictly extra-legal. The simplest rule of thumb to apply - this can get very complicated, but I will just give what you can use in your work - is to determine whether or not your use interferes with the sale of the original. That is, does it reduce the income? That's as good a guideline as any. That is, can they use your production as a substitute for original? That gives you wide leeway.

In the commercial music field, they have clearance agencies, at least three of them are operating VMI, ASCAP, and SESAC. The book publishers look with longing at what the composers and music publishers have, and they would like to have some such thing.

One of the troubles with clearing literary material is that it would take you forever. Each individual piece would have to get separate clearance. It's a nuisance. So a proposal has been made that the textbook publishers get together and form an ASCAP, that is, a clearing house where you could get clearance for the use of literary material. This, of course, would depend entirely on the elimination from the Act of the not-for-profit provision. They would like to reduce the opposition to revision by saying that they will provide a simplified method of clearance.

The copyright on any piece of writing protects only certain aspects of that writing. That is, it protects what we used to call, the literary form, not the idea. Ideas are not copyrightable. They are stealable any place. This is good for society. Everyone of us has borrowed ideas and elaborated on them, and this is what has made for progress. An idea should be free as a matter of public policy. The person who copyrights the expression of an idea copyrights only that form of expression. So to that extent any question or set of questions or test could not be protected against somebody else working on a somewhat similar test as long as he didn't copy the format.

The libraries have some serious problems growing out of the same technological developments with which you people are involved. That is, in the last 10 or 15 years, we have seen the development of all kinds of copying and duplicating devices. Since the library seeks to service, it likes to give people copies of an article in The Saturday Evening Post, for instance, which has been copyrighted. This has been driving the publications insane, because the library can't do this legally. This is what the Copyright Act prohibits, and yet the libraries are continuing to make copies. I know of no suit that has been filed by a publisher against a library for making a copy for a client. But such suits have been threatened.

There's only one library in the country that won't make you a copy, the Library of Congress. This is due to the unholy alliance between the Copyright Office and the Library of Congress. This is another problem that affects you. You see the Library of Congress gets his acquisitions through the Copyright Office. It doesn't have money enough to buy books; it gets them by donations from anybody who wants to copyright. Well, this isn't too bad when you put out an edition of books and send two copies to the Copyright Office.

If you make a film of an educational program or a video tape, they want two copies. You must make two extra copies at a cost of $300 or $400, and send them to the Copyright Office.

At the present time if one creates a piece of statuary, it can be copyrighted without providing a copy but by providing a description. A film is the same type of artistic production. The Copyright Office ought to have an identification, but a copy should not be necessary.

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COPYRIGHTS, CLEARANCES AND RIGHTS
OF
TEACHERS IN THE NEW EDUCATIONAL MEDIA

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REPORT ON

COPYRIGHTS, CLEARANCES AND RIGHTS

OF

TEACHERS IN THE NEW EDUCATIONAL MEDIA

LIST OF STAFF MEMORANDA

1. Procedures, Requisites, and Comparison of Common Law and Statutory Methods of Protecting Literary Property
2. Publication as the End of the Common Law Copyright in the New Media
3. The Use of Copyrighted Materials in the New Media
4. Does the Production and Sale of a Phonograph Record Divest the Uncopyrighted Composition of its Common Law Rights?
5. Copyrightability of the Various Recordings of Sights and Sounds
6. Is Exhibition Copying?: The Patterson Case and Its Effects
7. The Recording Clause of Sec. 1 (c), (d) and (e) of the Copyright Act
8. Notice of Copyright, Need For
9. The "Author" of a Motion Picture
10. The Meanings of the Words "Author," "Inventor," and "Writings" in Section 8 of Article I of the United States Constitution
11. Should Licenses Be Recorded?
12. Fair Use
13. Should the Provisions of 4 & 5 Eliz. IIC. 74, Sec. 4 Be adopted in the United States?
14. Copyright Office Practices with Regard to Deposit of Copies of Films
15. Copyright Practices in Great Britain and Canada as They Apply to the Education Field
16. The Component Parts Protected by a Copyright Notice with Particular Reference to Television and Motion Pictures
17. Right of Privacy Releases for Educational TV
18. Use of Copyrighted Dramas on Educational TV
19. Copyright Bibliography
    (Bringing Rothenberg Printed Bibliography down to July 1, 1962)

REPORT ON

COPYRIGHTS, CLEARANCES AND RIGHTS

OF

TEACHERS IN THE NEW EDUCATIONAL MEDIA

PART IV

RECOMMENDATIONS

1. The rights of the owner of an educational program prepared for the new media appear to be adequately protected under the common law rules of copyright or literary property enforceable under state law. Programs may be rented or leased for restricted use without destroying the common law protection. However, if duplicate copies of the program are prepared for sale, the owner should proceed to comply with the formalities of the federal copyright statute to protect his interests from unauthorized use.

2. Full and unrestricted ownership of the educational programs prepared for the new media is normally vested in the institution or organization which initiates the program and pays for its production, and therefore any teacher or performer wishing to retain any aspects of control of a program should have a definite contract, agreement, or statement reserving appropriate rights for him.

3. The arrangement between an educational program producer and the teacher (either by direct contract, by reference to an adopted set of by-laws or policies, or by collective bargaining agreement) should cover the following:

   a) initial compensation

   b) right to re-use both within and outside the originating organization

   c) compensation for re-use both within and outside the originating organization

   d) the right to specify the life of the program or length of time within which it may be used

   e) right to revise a part or all of a program or series of programs

   f) right to withdraw the program based on termination of employment, death, reassignment, or obsolescence.

4. Educational organizations with an interest in the new media should oppose the recommendation of the Copyright Office that the revision of the federal Copyright Act provide for the termination of common law copyrights when a work has been "publicly disseminated" in any of the following ways: (1) publication of copies, (2) registration, (3) public performance, or (4) public distribution of sound recordings. The adoption of such a definition of "publication" would require the formal statutory copyrighting of all educational programs prepared for the new media if the owner wished to protect his rights.

5. The present provisions of the federal Copyright Act permitting the use of non-dramatic literary materials and music in the production of not-for-profit educational programs without requiring clearance from the copyright owner should be retained in the statute. However, the recording provisions of Sec. 1(c) and Sec. 1(e) should be clarified to make certain that the not-for-profit use described above also permits the recording of these materials for not-for-profit purposes.

6. Organizations representing education in general should join with other organizations and institutions having special interests in the new educational media in the establishment of a Copyright Committee with the responsibility of developing legislative proposals for the revision of the present federal Copyright Act.

7. It is recommended that at some time in the near future a study be made of the methods of protecting educational programs for the new media in foreign countries so that international distribution can be facilitated. At the same time a study should be made of the existing restrictions on the use of educational materials from foreign countries in the preparation of new programs.

CONCLUSION

One participant in the Bench-Mark Seminar on Educational Television acknowledged the appropriateness of the bench-mark theme as a beginning place from which levels are measured. Still, he noted, the term might be interpreted to suggest the marks left on the bench by the player who didn't get into the game.

To carry his alternate suggestion a bit further, it is to be hoped that the Bench-Mark Seminar may bring educational administrators and governing boards to new consideration of the potentials inherent in the application of television to education. The game is on, the bench warmers will contribute little to the game unless they get into it.

Another participant observed that television is in American education, but it is not yet of American education. To make television of education there are policy-level and administrative-level decisions which must precede all else. The instrument must be available before the creative talents and initiative of the reservoir of teaching talent in schools, colleges and universities incorporate the advantages of this new medium into the methods and systems of American education.

Gratuitous advice is seldom appreciated, but on occasion such advice strikes an open eye or ear. In this instance, the educational administrator and the policy maker are urged to gather printed materials from one or more of the sources listed later in this report, read and digest them, and pass them on to others who participate in the decision-making by the Board or the executive group.

Secondly, seek out an experienced person in educational television, someone who has had responsibility for the installation of ETV or ITV into a school system or college or university, and bring him before your administrative or governing group to discuss educational television with you.

Then, set forth by delegating responsibility to an appropriate person or committee to study the needs and problems of the school system or institution in relation to the potentials of television, to meet those needs and to help solve the identified problems.

In the interim of assessment and study, the committee should be provided sufficient time at appropriate intervals for reports and discussions with the Board or executive group. By this process of building awareness and participation you will isolate and define the points of decision relative to the question of whether or not educational television holds answers for some or several of the problems which the institution faces today and tomorrow.

If the decision is negative, hold the matter open and ask your committee to continue to keep pace with the advance of educational and instructional television. You may very well wish to reconsider at an early date.

If the decision is made to embark into educational television, then consider carefully the wisdom of retaining a competent consultant to assist with the embarkation and the problems of getting underway and to build staff competence.

Simple advice, like this, may not catch the attention of the educator while he tends to today's problems. Education is plagued today with the doing of the urgent at the expense of the important. Educational television is important. It should not be given the casual and the cursory once over

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lightly. Decisions about educational television should not be made on such a basis, but decisions about educational television should be considered carefully by every responsible administrator and policy maker in American education. Its achievements to date command such attention.

APPENDIX - A

MEMBERS

Sub-Committee on Television
North Central Association of Colleges and Secondary Schools

Donald G. Emery
Shaker Heights Public Schools
Shaker Heights, Ohio

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Youngstown, Ohio

Elizabeth Golterman
Director of Audio-Visual Education
St. Louis Public Schools
St. Louis, Missouri

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Ohil State University
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Jack McBride
Director of Television and KUON - TV
University of Nebraska
Lincoln, Nebraska

Lawrence E. McKune
Associate Professor
Continuing Education on Television
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East Lansing, Michigan

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Principal, Broad Ripple High School
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PROJECT STAFF

Richard B. Hull
Director

Dean C. Cannon
Coordinator

Martha Haueisen
Secretary

PARTICIPANTS

Bench-Mark Seminar
December 5-8, 1963

David W. Bergstrom, Professor, Zoology and Physiology
Miami University
Oxford, Ohio

Television instructor in zoology for six years in and for a pioneering institution in educational television

Benjamin Bohnhorst, Acting Vice President
Midwest Program on Airborne Television Instruction
Purdue University
Lafayette, Indiana

Director of Course Development, MPATI, 1960-63; Formerly, Coordinator, Primary Reading Project, Lindale, Georgia, Professor of Education, Oglethorpe University and Director of Curriculum Development Georgia State Department of Education.

T.H.Broad, Supervising Coordinator of Instructional Improvement
Public Schools
Oklahoma City, Oklahoma

Norman Burns, Executive Secretary
North Central Association of Colleges and Secondary Schools
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Edwin Cohen, Director
National Instructional Television Library
New York, New York

Program Associate, National Educational Television and Radio Center; Formerly, Supervisor, National Educational Television Film Service, Audio-Visual Center, Indiana University

Theodore Conant, Consultant, Classroom Television
Film Board of Canada
Montreal, Canada

Lawrence T. Frymire, Chief, Educational Broadcasting Branch
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Formerly, Manager of WKAR, WKAR-FM, educational radio stations, Michigan State University and participant in the development of WMSB-TV, Michigan State University

Hartford N. Gunn, Jr., General Manager
WGBH-TV
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General Manager, WGBH-TV, since 1957; formerly, Assistant General Manager, 1956-57; Director of Operations, 1951-56; President and Founder, Eastern Educational Network; Member, Board of Directors, National Association of Educational Broadcasters.

Herbert V. Hake, Director, Radio and Television
State College of Iowa
Cedar Falls, Iowa

Director of Radio and Television since 1950; Producer of TV Schooltime series, "Landmarks in Iowa History", winner First Award for school telecast, Institute for Education by Radio-Television, 1955; Producer, "History with Herb Hake", Educational Television Network, 1958.

Joseph H. Kanner, Chief, Audio-Visual Applications Office
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Purdue University
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Wanda Mitchell, Television Teacher
Evanston Township High School
Evanston, Illinois.

Burton Paulu, Director, Radio and Television
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Minneapolis, Minnesota

Formerly, Secretary, Vice-president, President and Director, National Association of Educational Broadcasters; awarded Fulbright and Ford Foundation grants to study broadcasting.

Roger E. Peterson, Consulting Engineer
Jansky & Bailey
Atlantic Research Corporation
Washington, D.C.

Oscar Reed, Jr., Head, Broadcasting-Television Division
Jansky & Bailey
Atlantic Research Corporation
Washington, D.C.

Since 1939, consulting engineer, Jansky & Bailey; Registered professional engineer, Washington, D.C. and Maryland; Senior Member, Institute of Electrical and Electronic Engineers; Consultant to National Association of Educational Broadcasters, since 1960.

John C. Schwarzwalder, General Manager
KTCA-TV
St. Paul, Minnesota

Warren F. Seibert, Professor and Head
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Purdue University
Lafayette, Indiana

Formerly, TV Program Research Consultant, TV Program Research Unit and Associate Professor, Purdue University; Assistant Professor of Psychology, Purdue University Calumet Campus; Director, International Seminar On Instructional Television, 1961; Senior Research Coordinator, Educational Media Branch, U.S.Office of Education, 1959-60.

Appendix - B
Participants (cont'd)

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East Lansing, Michigan

Formerly, Director, School of Journalism, University of Illinois; Member of the Illinois Bar; Directed study, "Copyrights, Clearances and Rights of Teachers in the New Educational Media", for American Council on Education, under grant from U.S.Office of Education, 1962-63; Consultant, U.S.Copyright Office on proposed revision of Copyright Act.

Ralph Steetle, Director
Divisional Relations
Oregon State System of Higher Education
Portland, Oregon

Formerly, Executive Director, Joint Council on Educational Television; Director of Broadcasting, Louisiana State University; Consultant, U.S.Department of State; Officer, Division of Cultural Relations, U.S.Department of State; Consultant, UNESCO.

C. Walter Stone, Director and Professor of Education
Center for Library and Educational Media Studies
Graduate Library School
University of Pittsburgh
Pittsburgh, Pennsylvania

Formerly, Director, Educational Media Branch, U.S.Office of Education; Consultant on Mass Media, U.S.Office of Education; Professor of Library Science, University of Illinois; Chief, Audio-Visual Department and TV Coordinator, Detroit Public Library; Librarian, American Association for Adult Education and Research Assistant, Institute of Adult Education, Teachers College, Columbia University.

Edward P. Wegener, Director
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Harold E. Wigren, ETV Consultant
National Education Association
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Benjamin H. Willis, Superintendent
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